



COORDINATED HIGHWAYS ACTION RESPONSE TEAM
STATE HIGHWAY ADMINISTRATION

CHART External Connections Update Detailed Design

**Contract SHA-06-CHART
Document # WO54-DS-001
Work Order 54 Deliverable 4**

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1 Introduction

1.1 Purpose

This document describes the design of the software for CHART ATMS Release 16. The CHART ATMS R16 release provides the new features listed below. These features are being developed under two separate work orders, WO53 and WO54, as indicated.

- **WO53, RV Vehicle Type:** Two new vehicle types are being added for specifying the vehicles involved in an incident; RV, and RV with trailer. An RV can be marked as involved or overturned, and an RV with trailer can be marked as involved, overturned, jack-knifed, or lost load. All places in the system where a description of the vehicles involved in an incident will show these new vehicle types when appropriate. This includes notifications, and the system profile will allow a notification abbreviation to be specified for each of these new vehicle types. The vehicle types will be included in the list of vehicle types that are exported for an incident.
- **WO53, Date Commissioned Field:** A new field will be added for all device types to allow the date when a device is first commissioned for use to be recorded and viewed. This includes the following device types: DMS, HAR, SHAZAM, On/Off Device, TSS, Camera, and Monitor. The date commissioned can be set when adding or editing any of these device types, and can be viewed on the details page for the device. This new field is not exported.
- **WO53, List of Call Lists Enhancement:** The page that shows all of the call lists defined in the system is being enhanced to allow the user to click on the name of any contact that appears in a call list and see their details, such as phone numbers and e-mail address. This is similar to the information that can currently be viewed for a contact that is included as a participant in a traffic event.
- **WO53, Incident Sub-Types:** Incidents will now allow the user to specify a sub-type in addition to the incident type. The list of valid sub-types will be specific to each incident type and will be defined by an administrator in the system profile. The incident sub-type, if specified, will appear as part of the traffic event name when the traffic event appears within CHART ATMS and be a searchable as text within the search traffic event field. This sub type will not be part of the incident name that is exported; it is for internal use only.
- **WO53, ATMS-1805:** This is an LCP integration enhancement that was made following deployment of CHART ATMS R15. Links that appear for permits that are shown within CHART ATMS to allow the user to create a new pending event to be associated with the permit or to view an existing pending event that is associated have been removed, as users were forgetting to activate the permits. The remaining links drive the users toward the intended work flow.
- **WO53, Task 104 PRs:** Several problem reports are addressed in this release. Following is a list of these PRs, with their identifying number and short description:

ATMS-536: E-mail address verification for contacts will be corrected such that it flags an address with two consecutive periods as invalid. Furthermore, code will be corrected such that when sending a notification, an invalid e-mail address will not prevent the status from being updated for all recipients.

ATMS-571: The location editing form is being updated such that when county mileposts are selected, instead of allowing the user to enter any number they like, the system will present them with a valid range for the selected county / route, as it currently does for state mileposts.

ATMS-597: The direction of “South/North” for locations will be changed to “North/South” to match the common language for describing a location that affects both the northbound and southbound directions.

ATMS-635: The CHART ATMS Data Exporter will be enhanced to better handle escaping of special characters, such as an apostrophe that is cut from a Microsoft Word document and pasted into the notes field for a participant.

ATMS-638: The system will be corrected to properly enforce user rights required to associate an Area of Responsibility (AOR) with a monitor such that a user without the rights to configure the monitor will not be able to edit the associated AORs or disassociate an AOR that is already associated with the monitor.

ATMS-643: The description of the lanes closed when a lane and shoulder are both closed will be enhanced to provide greater clarity. Currently the system has a description such as “1/1 Eastbound-Shoulder closed” when the eastbound travel lane and eastbound shoulder are closed, which is not clear.

ATMS-649: The system will be enhanced to allow multiple e-mail addresses to be entered for each contact. This will allow notifications to be sent to a user’s work and personal e-mail for example.

ATMS-651: An extension field will be added for all contact phone numbers.

ATMS-655: The system will be enhanced to log information about a contact in the event history log and operations log for all operations involving participants in a traffic event that have an associated contact (including adding or removing the contact). Additionally all operations related to the uses of contacts as standalone participants will include the contact name in their event history and operations log messages.

ATMS-657: The system will be changed to allow the “All Toll Rates Expired” notification to be sent even when a “No Toll Rates Posted in the last X minutes” condition is currently active, as the former is a more serious condition and should not be masked by the latter.

ATMS-658: The contact list page will be enhanced to no longer show “do not contact”

schedules once they have expired.

ATMS-868: A new attribute will be added for DMS, HAR, SHAZAM, and TSS to indicate if their export should be managed via new user rights that can be given to external clients. This new “Managed Export” flag will be added to the Add and Edit Basic Settings forms for these devices, as well as the device details pages and device lists. The new Managed Export column in device lists will be sortable and filterable. (Note: This new field does not need to be added for Monitors or On/Off Devices because those devices are not exported. The field is being added for Cameras as part of a different task under WO54 and is described as part of that task.

ATMS-1805: Links will be removed that allow the user to create a pending event to be associated with a permit, or to view a pending event associated with a permit, in order to encourage use of the new workflow added in ATMS R15. The correct workflow is to use the Activate and Queue links to manage the associated pending event.

- **WO53, Training Environment Enhancements:** The ATMS training environment, hosted at the Statewide Operations Center (SOC) will be enhanced to more accurately duplicate the production environment. This will provide users with a more realistic learning environment.
- **WO53, COTS Upgrades (Java and Tomcat):** Tomcat, the product used to host the CHART ATMS GUI and all CHART ATMS web services, will be updated to version 8.0.30. The Java product used to run all CHART ATMS services and Tomcat instances will be updated to version 8u74 (a.k.a. 1.8.0_74).
- **WO54, CHART External Interface Updates**
 - **CHART CCTV Export:** A new flag will be added to the ATMS that is used to indicate Cameras that require External Clients to have a special functional right to receive exported info for the camera. Cameras in ATMS will also have a new “Camera Category” attribute which will allow 0, 1 or more categories for a camera. Users will select from a system wide list of supported Camera Categories. Camera categories will be exported to downstream systems for grouping cameras. A new attribute will be added to each Streaming Server Configuration in ATMS which will identify them as being in the ‘Public’, ‘Internal’ ‘SWGf’ or ‘MVIEW’ zone. This new zone field will be exported (as part of CCTV Camera export information) for use by downstream systems. External clients will require a functional right to receive exported Streaming Server Info for each zone (separate functional right for each zone). This encompasses and expands on PR ATMS-656. That PR will be closed upon completion of WO54.
 - **CHARTWeb Traffic Cameras popup and page:** Will integrate Chart Web’s Traffic Camera section with changes to CCTV export. Links and table will be generated using CCTV Export’s new json feed instead of the current direct calls to database server. Traffic Cameras page will also be modified to remove the tabbed interface in favor of a navigation bar.

- **CHARTWeb Traffic Cameras RSS/XML feed:** The XML feed in CHARTWeb will now be created using CCTV Export's new json feed instead of its current direct call to the database server.
- **Intranet Map 'managed export' device flag:** Cameras and other devices displayed on the Intranet Map will now be controlled by the ATMS rights given to the internal export client for each organization. The flags regarding display on Intranet Map and Public Map will be eliminated.
- **Mapping REST Services 'managed export' device flag:** Mapping rest services that provide data to external clients will filter out cameras and other devices (part of ATMS-868) based on the 'managed export' flag (except for IMap rest services). The URL provided for the video feed for a camera will be for the 'Public' SFS zone.
- **Intranet Map Camera SFS zone:** The video feeds for the cameras displayed on the Intranet Map will use the 'Internal' SFS zone.
- **Mapping REST Services Camera SFS zone:** The URL provided for the video feeds will be for the "Public" SFS zone.
- **WO54, Lufft Interface:** CHART system will now acquire weather sensor data from Lufft via .csv files exported by SmartView, instead of via direct MySQL database access. The imported data will be translated and saved to the CHARTWeb database for use by all CHART applications. In addition, database entities related to weather sensor data in the CHART Web database will be improved and consolidated.

1.2 Objectives

The main objective of this detailed design document is to provide software developers with a framework in which to implement the requirements identified in the CHART ATMS R16 Requirements document. A matrix mapping requirements to the design is presented in Section 7 (Mapping to Requirements).

1.3 Scope

This design is limited to Release 16 of the CHART ATMS. It addresses both the design of the server components of CHART ATMS and the Graphical User Interface (GUI) components of CHART ATMS to support the new features being added. This design does not include designs for components implemented in earlier releases of the CHART ATMS.

1.4 Design Process

The design was created by capturing the requirements of the system in UML Use Case diagrams. Class diagrams were generated showing the high level objects that address the Use Cases. Sequence diagrams were generated to show how each piece of major functionality will be achieved. This process was iterative in nature – the creation of sequence diagrams sometimes caused re-engineering of the class diagrams, and vice versa.

1.5 Design Tools

The work products contained within this design were extracted from the Enterprise Architect design tool. Within this tool, the design is contained in the project named “chartdesign” in the folder named “CHART-ATMS-R16”.

1.6 Work Products

The final CHART ATMS Release 16 design consists of the following work products:

- Human-Machine Interface section which provides descriptions of the screens that are changing or being added in order to allow the user to perform the described uses.
- Use Case diagrams that capture the requirements of the system
- UML Class diagrams, showing the software objects which allow the system to accommodate the uses of the system described in the Use Case diagrams
- UML Sequence diagrams showing how the classes interact to accomplish major functions of the system
- Requirement Verification Traceability Matrix that shows how this design meets the documented requirements for this feature

2 Architecture

The sections below discuss specific elements of the architecture and software components that are created, changed, or used in CHART ATMS Release 16.

2.1 Network/Hardware

CHART ATMS Release 16 features do not impact the network or hardware architecture of the CHART ATMS system.

2.2 Software

CHART ATMS uses the Common Object Request Broker Architecture (CORBA) as the base architecture, with custom built software objects made available on the network allowing their data to be accessed via well-defined CORBA interfaces. Communications to remote devices use the Field Management Server (FMS) architecture. Newer external interfaces such as the User Management web service, Data Exporter, and GIS service employ a web services architecture combining an HTTP request/response structure to pass XML messages.

Except where noted in the subsections below, CHART ATMS Release 16 features do not impact the software architecture of the CHART ATMS.

2.2.1 COTS Products

CHART ATMS uses numerous COTS products for both run-time and development. Table 2-1 contains existing and new COTS products.

Table 2-1. ATMS COTS Products

Product Name	Description
Adobe Flex SDK	CHART uses the Flex SDK 4.6 to provide the Flex compiler, the standard Flex libraries, and examples for building Flex applications used by the CHART ATMS GUI.
Apache ActiveMQ	CHART uses this to connect to RITIS JMS queues.
Apache Commons Lang3	CHART uses commons-lang3-3.3.2 for various string utility methods provided by this library. For example, the RandomStringUtils class is used to generate random passwords for password reset requests.
Apache Jakarta Ant	CHART uses Apache Jakarta Ant 1.9.6 to build CHART applications and deployment jars.
Apache PDFBox	CHART uses this library for generating PDF documents from ATMS web pages (e.g., the list of contacts)
Apache Tomcat	CHART uses Apache Tomcat 8.0.30 as the GUI web server.
Apache XML-RPC	CHART uses the apache xmlrpc java library 3.1.2 protocol that uses XML over HTTP to implement remote procedure calls. The video Flash streaming “red button” (“kill switch”) API uses XML over HTTP remote procedure calls.
Bison/Flex	CHART uses Bison and Flex as part of the process of compiling binary macro files used for performing camera menu operations on Vicon Surveyor VFT cameras.
bsn.autosuggest	The event resource search feature and the EORS integration feature use version 2.1.3 of the bsn.autosuggest JavaScript code from brandspankingnew.net. This tool is freely available and is included as source code in the CHART GUI. It provides a

Product Name	Description
	simple JavaScript tool that can be associated with a text entry field. It uses AJAX to provide search results / suggestions as the user types.
CoreTec Decoder Control	CHART uses a CoreTec supplied decoder control API for commanding CoreTec decoders.
Dialogic API	CHART uses the Dialogic API for sending and receiving Dual Tone Multi Frequency (DTMF) tones for HAR communications.
GIF89 Encoder	Utility classes that can create .gif files with optional animation. This utility is used for the creation of DMS True Display windows.
Java	The ATMS is built with and runs under Java 1.8.0_74.
JAXB	CHART uses the jaxb java library to automate the tedious task of hand-coding field-by-field XML translation and validation for exported data.
JDOM	CHART uses JDOM b7 (beta-7) dated 2001-07-07. JDOM provides a way to represent an XML document for easy and efficient reading, manipulation, and writing.
JacORB	CHART uses a compiled, patched version of JacORB 2.3.1. The JacORB source code, including the patched code, is kept in the CHART source repository.
JavaMail API	The CHART Notification Service uses the JavaMail API 1.4.4, an optional Java package which provides SMTP e-mail support.
Java Run-Time (JRE)	CHART uses 1.8.0_74 (32-bit needed for ATMS Services; 64-bit for Tomcat if > 1.5 GB heap size needed).
JavaService	CHART uses JavaService to install the server side Java software components as Windows services.
JAXEN	CHART uses JAXEN 1.0-beta-8 dated 2002-01-09. The Jaxen project is a Java XPath Engine. Jaxen is a universal object model walker, capable of evaluating XPath expressions across multiple models.
JoeSNMP	CHART uses JoeSNMP version 0.2.6 dated 2001-11-11. JoeSNMP is a Java based implementation of the SNMP protocol. CHART uses for commanding iMPath MPEG-2 decoders and for communications with NTCIP DMSs.
JSON-simple	CHART uses the JSON-simple java library to encode/decode strings that use JSON (JavaScript Object Notation).
JTS	CHART uses the Java Topology Suite (JTS) version 1.8.0 for geographical utility classes.
JWPlayer	CHART ATMS GUI uses JWPlayer version 6.8.4616 to display streaming video.
Log4J	CHART uses the log4J version 1.2.15 for logging purposes.
Microsoft Visual Studio	CHART uses Visual Studio 2012 to build native JNI DLLs and executables.
NSIS	CHART uses the Nullsoft Scriptable Installation System (NSIS), version 2.45, as the server side installation package.
NeoSpeech Text To Speech	For text-to-speech (TTS) conversion CHART uses NeoSpeech TTS version 3.10.7.
OpenLayers	CHART ATMS GUI uses the OpenLayers JavaScript API 2.13.1 (http://openlayers.org/) in order to render interactive maps without relying on vendor specific software. OpenLayers is an open source product released under a BSD style license which can be found at (http://svn.openlayers.org/trunk/openlayers/license.txt).
O'Reilly Servlet	Provides classes that allow the CHART GUI to handle file uploads via multi-part form submission.
Prototype Javascript Library	The CHART ATMS GUI uses the Prototype JavaScript library, version 1.7.2, a cross-browser compatible JavaScript library provides many features (including easy Ajax support).
SAXPath	CHART uses SAXPath 1.0-beta-6 dated 2001-09-27. SAXPath is an event-based

Product Name	Description
	API for XPath parsers, that is, for parsers which parse XPath expressions.
MSSQL Server	CHART uses MS SQLServer (2008 R2) as its database and uses the MS SQL Server JDBC libraries (sqljdbc4.jar) for all database transactions.
SQLServer JDBC Driver	CHART uses this driver to lookup GIS related data and also to store Location Aliases in SQL Server databases.
Velocity Template Engine	Provides classes that CHART GUI uses in order to create dynamic web pages using velocity templates, CHART uses Velocity version 1.6.1 and tools version 1.4.
Vicon V1500 API	CHART uses a Vicon supplied API for commanding the ViconV1500 CPU to switch video on the Vicon V1500 switch.

2.2.2 Deployment /Interface Compatibility

2.2.2.1 External Interfaces

This section describes the external interfaces being added in Release 16 of CHART ATMS. See Figure 2-1.

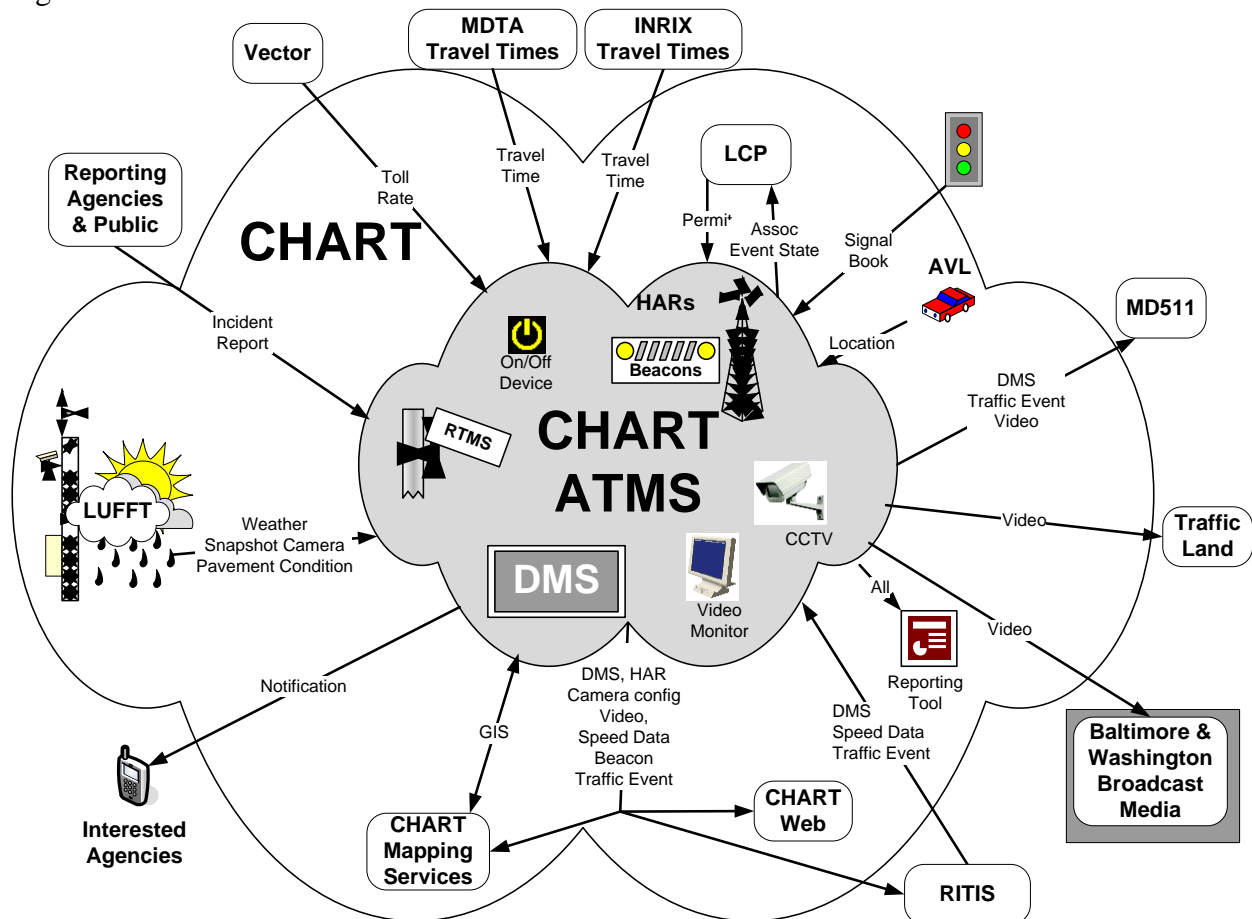


Figure 2-1. CHART and External Interfaces

The ATMS will now acquire weather sensor data from Lufft via .csv files exported by SmartView, instead of via direct MySQL database access. Control of which devices are exported

to which external clients will be controlled by rights granted to those clients. Camera SFS data will be similarly managed, with only appropriate SFS information exported to each client. Server and GUI deployment diagrams are shown in Figure 2-2 and Figure 2-3.

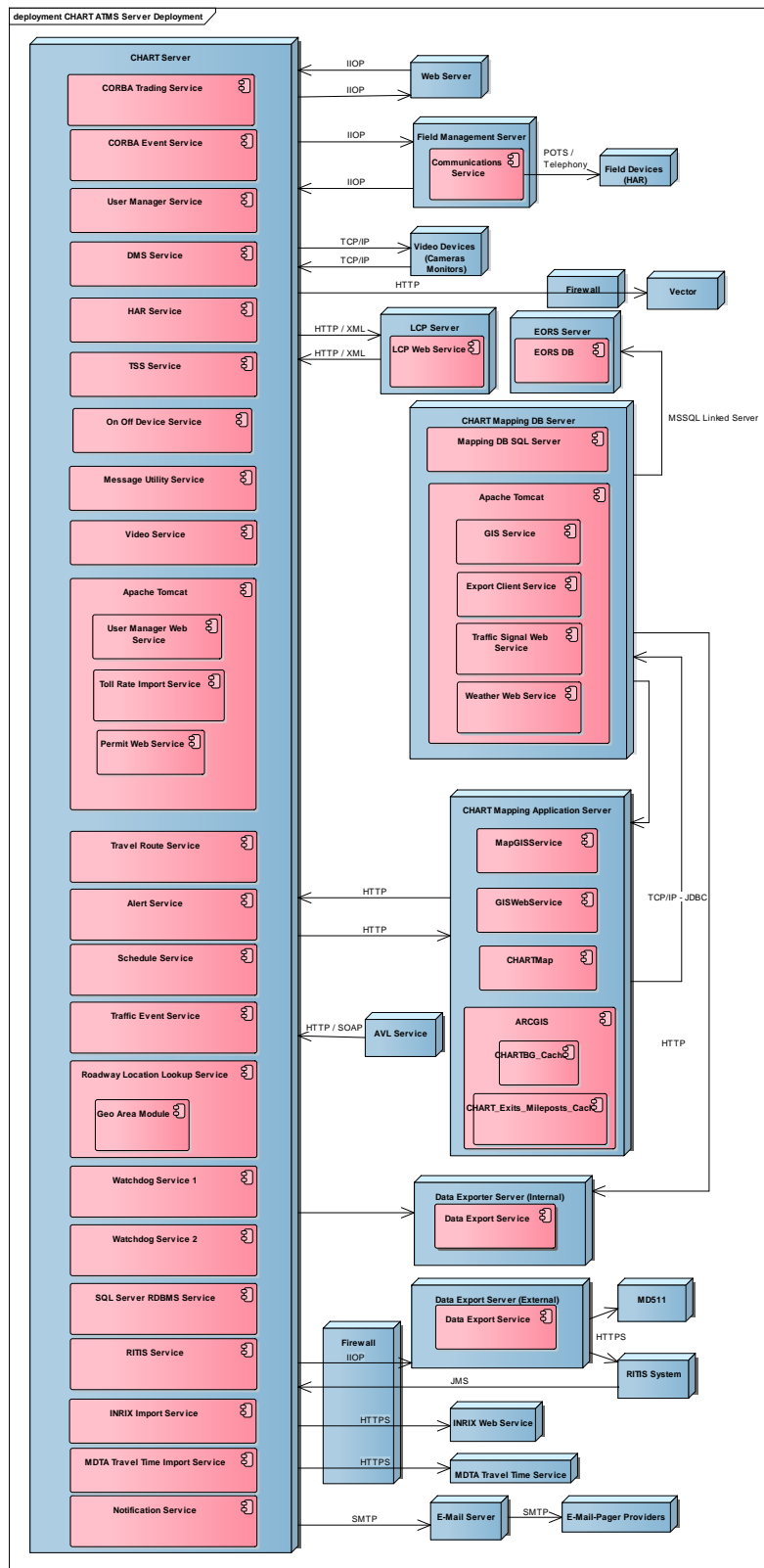


Figure 2-2. R16 Server Deployment

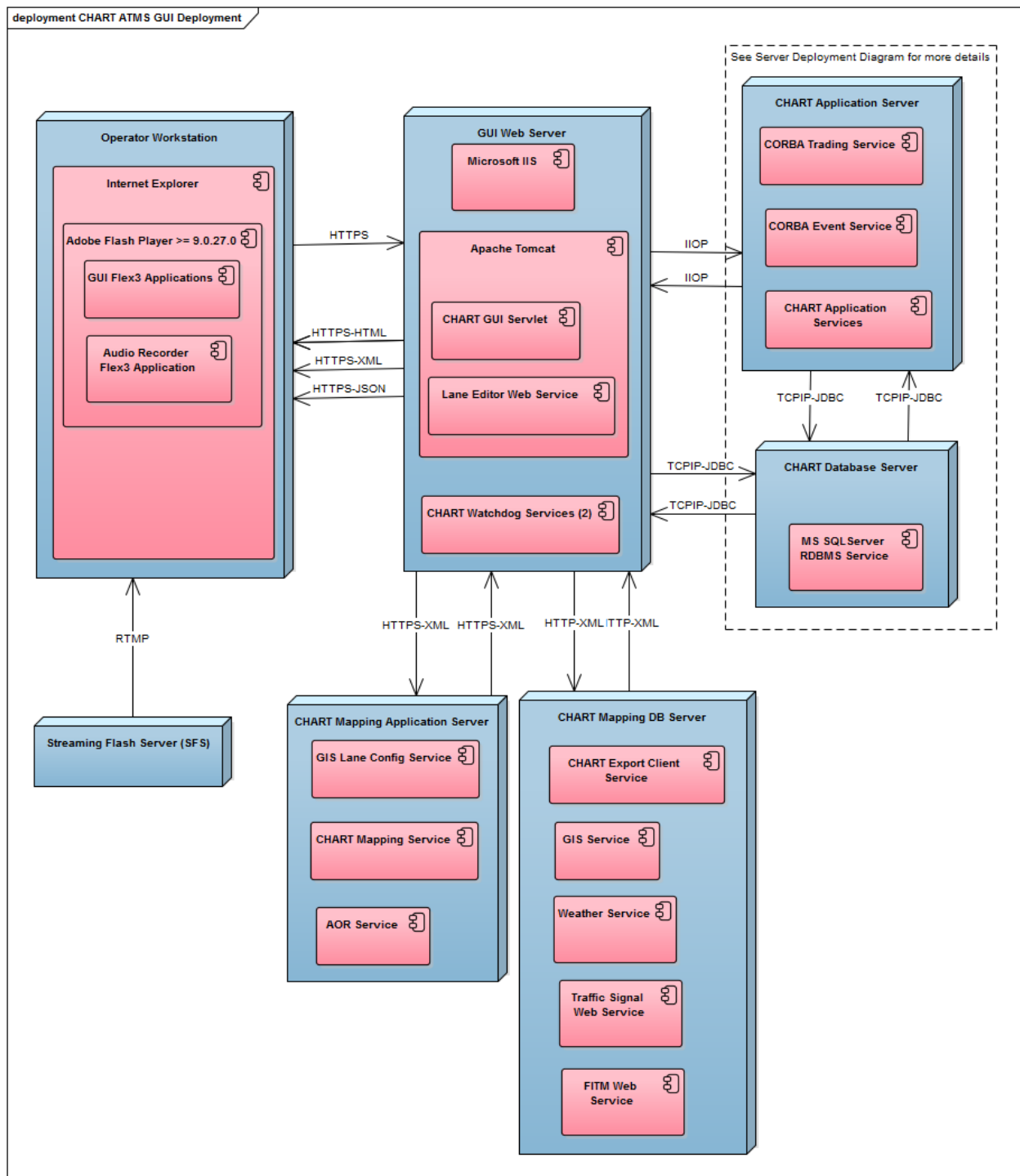


Figure 2-3. R16 GUI Deployment

2.2.2.2 Internal Interfaces

This section describes the internal interfaces added or modified in Release 16 of the CHART ATMS system.

1. The Device Commissioned Date feature modifies the device configuration structure (or value type) for each of the following device types in the IDL to add a device commissioned date field: DMS, HAR, SHAZAM, TSS, Camera, Monitor, and On/Off Device.
2. PR ATMS-868 also modifies the device configuration structure (or value type) for each of the following device types in the IDL to add a flag to indicate if the device export is managed via a user right that can be applied to external clients: DMS, HAR, SHAZAM, and TSS.
3. The CCTV Export Enhancements modifies the camera configuration structure in the IDL to add a flag which indicates that the Export Managed Camera function right is required to receive export information for the camera. Old displays on Intranet Map / Public Map flags are removed. It is also modified to allow an optional list of camera categories (strings) which are used by downstream systems to group cameras. Also, the streaming server configuration structure is modified to add a zone type for each streaming server. Possible zone type values are: Public, Internal, SWGI and MVIEW.
4. Traffic Event IDL is modified to support a new set of RV vehicle types (with/without trailer, involved, overturned, lost load, etc.) and a sub-type for incidents. (This sub-type exists within the ATMS only. It is archived, but not exported.)
5. Contact Management IDL is modified to support optional extensions for phone numbers and multiple email addresses for each contact. Each email address can be marked for use for notifications or not.

2.3 Security

This section describes the security being added or modified in Release 16 of CHART ATMS. Unless noted, features being added for CHART ATMS Release 16 do not change security aspects of the CHART ATMS.

2.4 Data

2.4.1 ATMS

CHART ATMS Release 16 is tested and delivered with the fielded MS SQL Server version.

2.4.1.1 Data Storage

The CHART ATMS stores most of its data in a non-spatial MS SQL Server database. Additionally location aliases are stored in a spatial SQL Server database. Some data is stored in flat files on the CHART servers.

This section describes all of these types of data.

2.4.1.2 Database

2.4.1.2.1 Database Architecture

Except as noted, CHART ATMS Release 16 features do not impact the overall architecture of the CHART ATMS database.

2.4.1.2.2 Logical Design

2.4.1.2.2.1 CHART Live Database Entity Relationship Diagram (ERD)

The CHART ATMS CHART_Live Database entity relationship diagram for R16 is shown below in the 21 figures that follow, in Figure 2-5 through Figure 2-25. Figure 2-5 is a visual table of contents into the remaining figures. The remaining figures should be mentally arranged into a grid five images wide (numbered 1-5) and five images tall (numbered 0-4), if desired to follow tables that had to be split across pages and connector lines which transverse between pages. Figure 2-6 is in the upper left, with Figure 2-7 through 2-10 to the right, with Figure 2-11 starting the second row. Note that some figures would be completely blank, and are not included, as shown in the visual table of contents in Figure 2-5. The Table Definition Report sections that follow describe the changes that are made for R16.

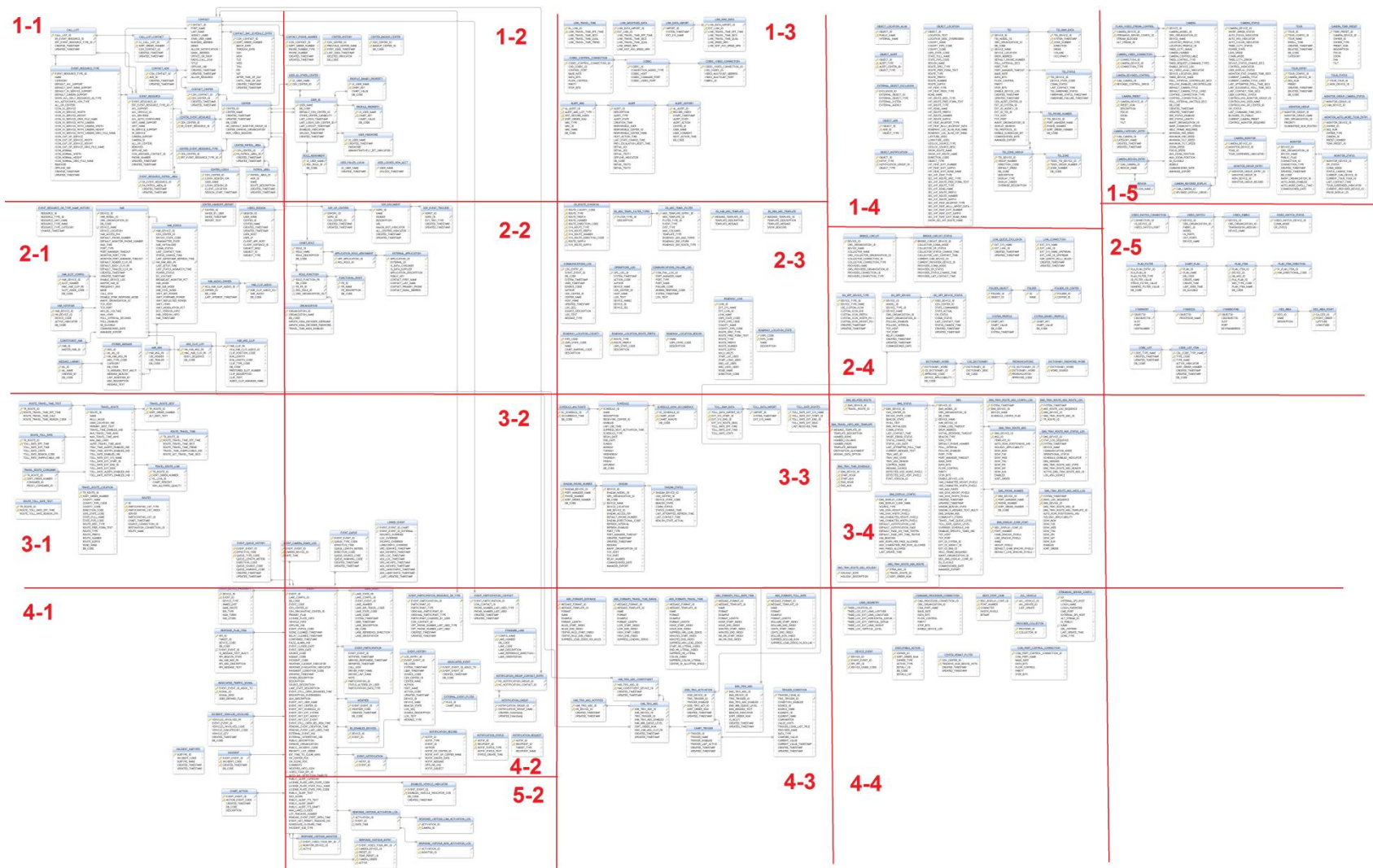


Figure 2-4. CHART_Live ERD, Visual Table of Contents

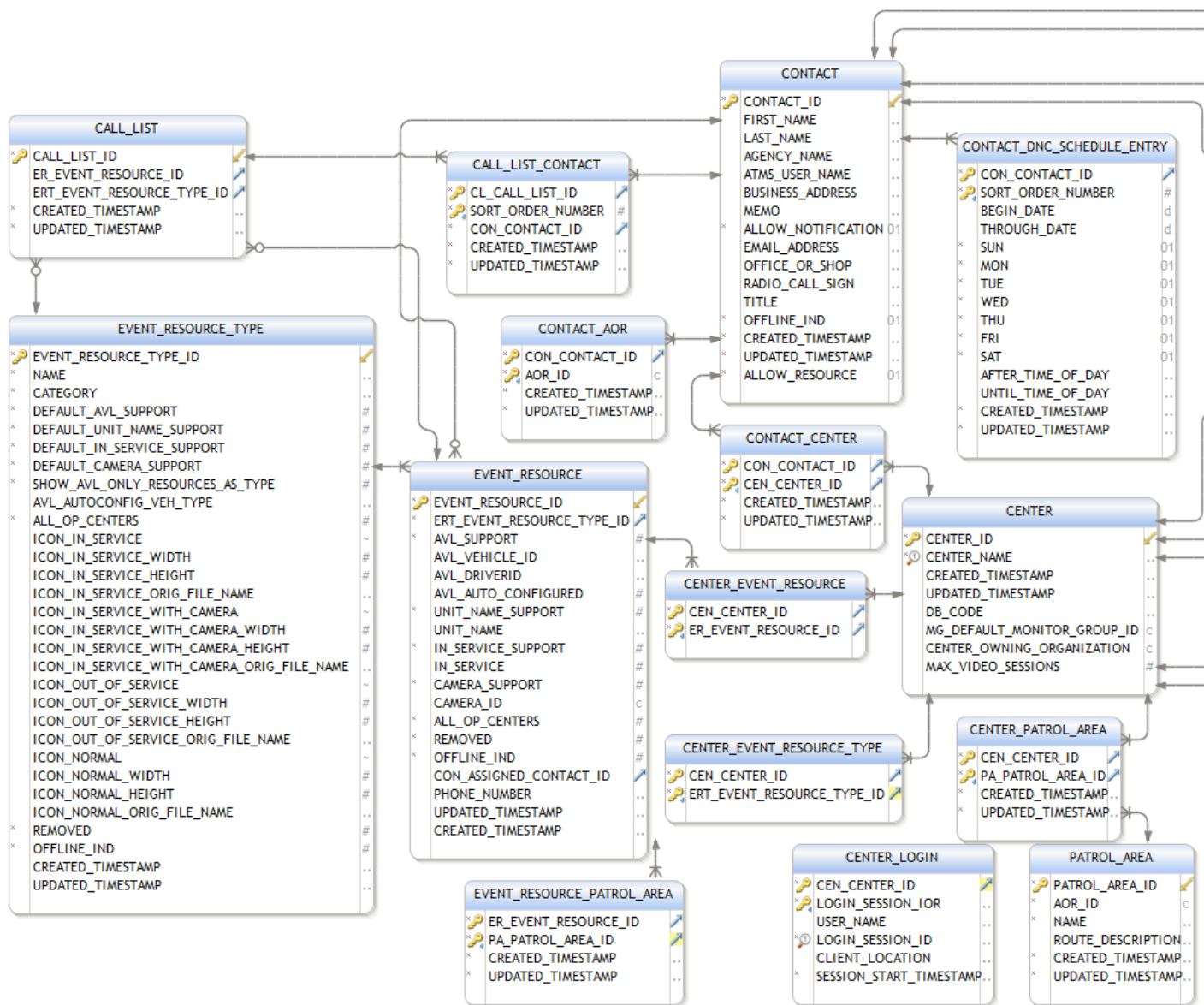


Figure 2-5. CHART_Live ERD, Page 1-1

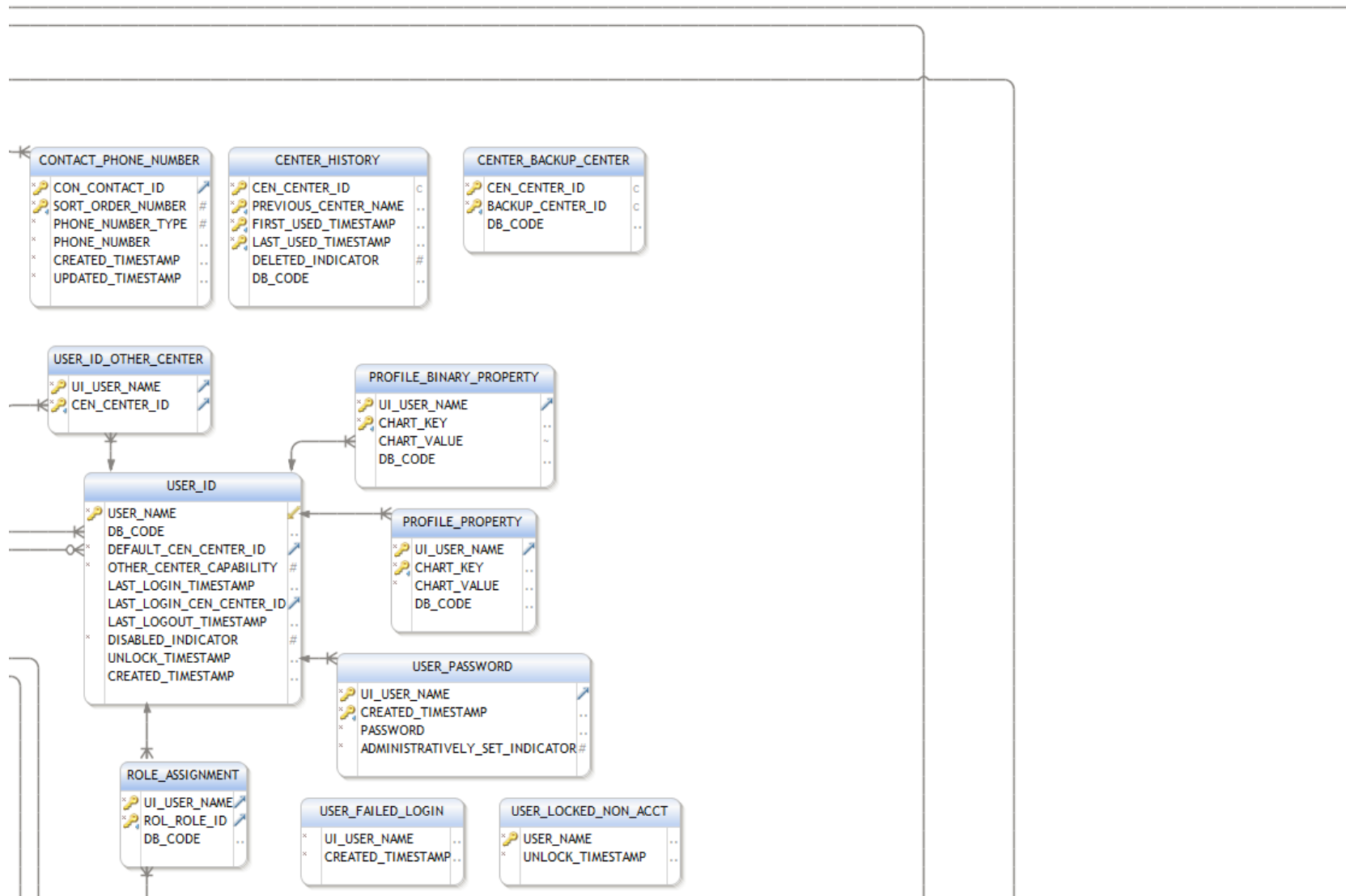


Figure 2-6. CHART_Live ERD, Page 1-2

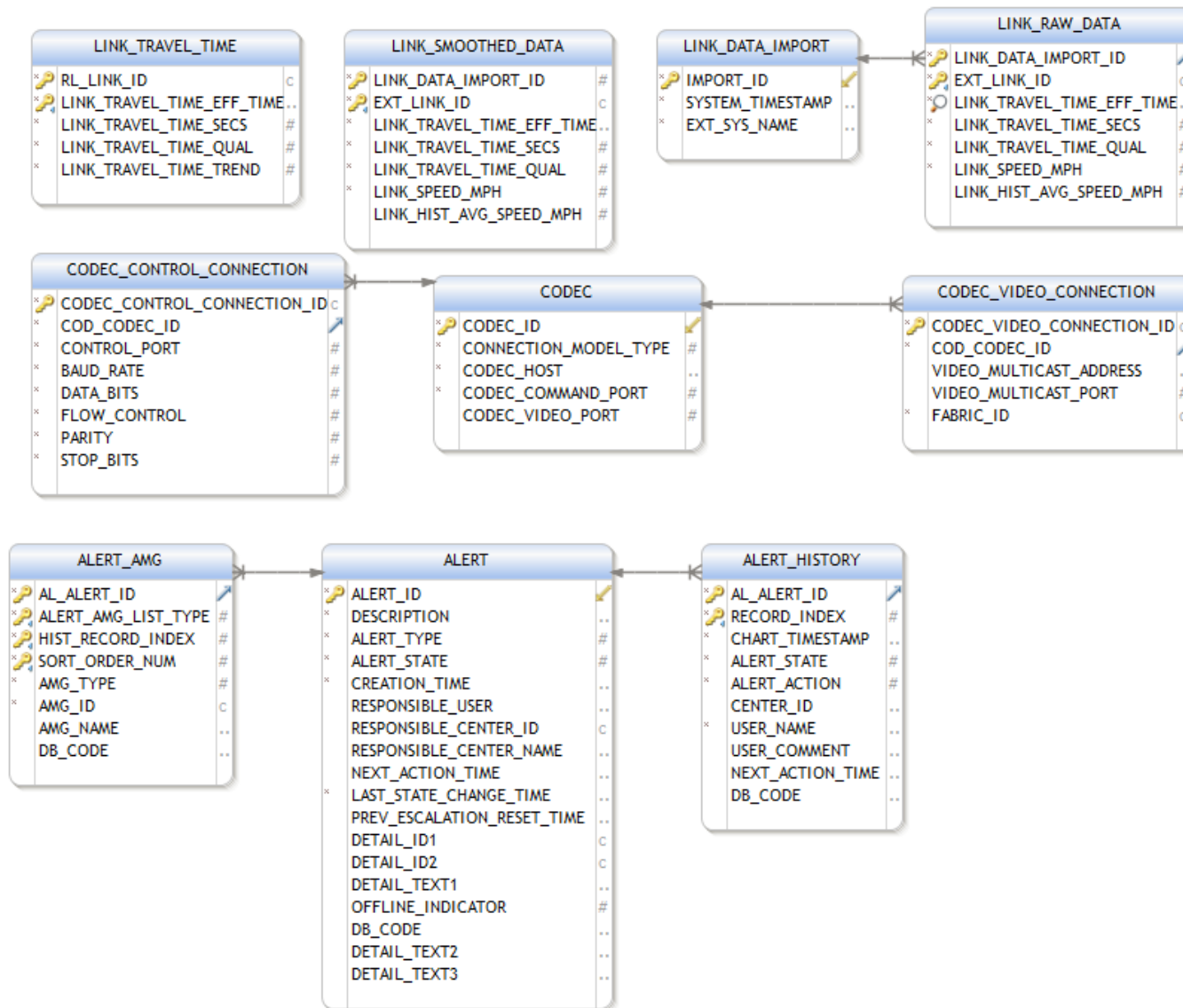


Figure 2-7. CHART_Live ERD, Page 1-3

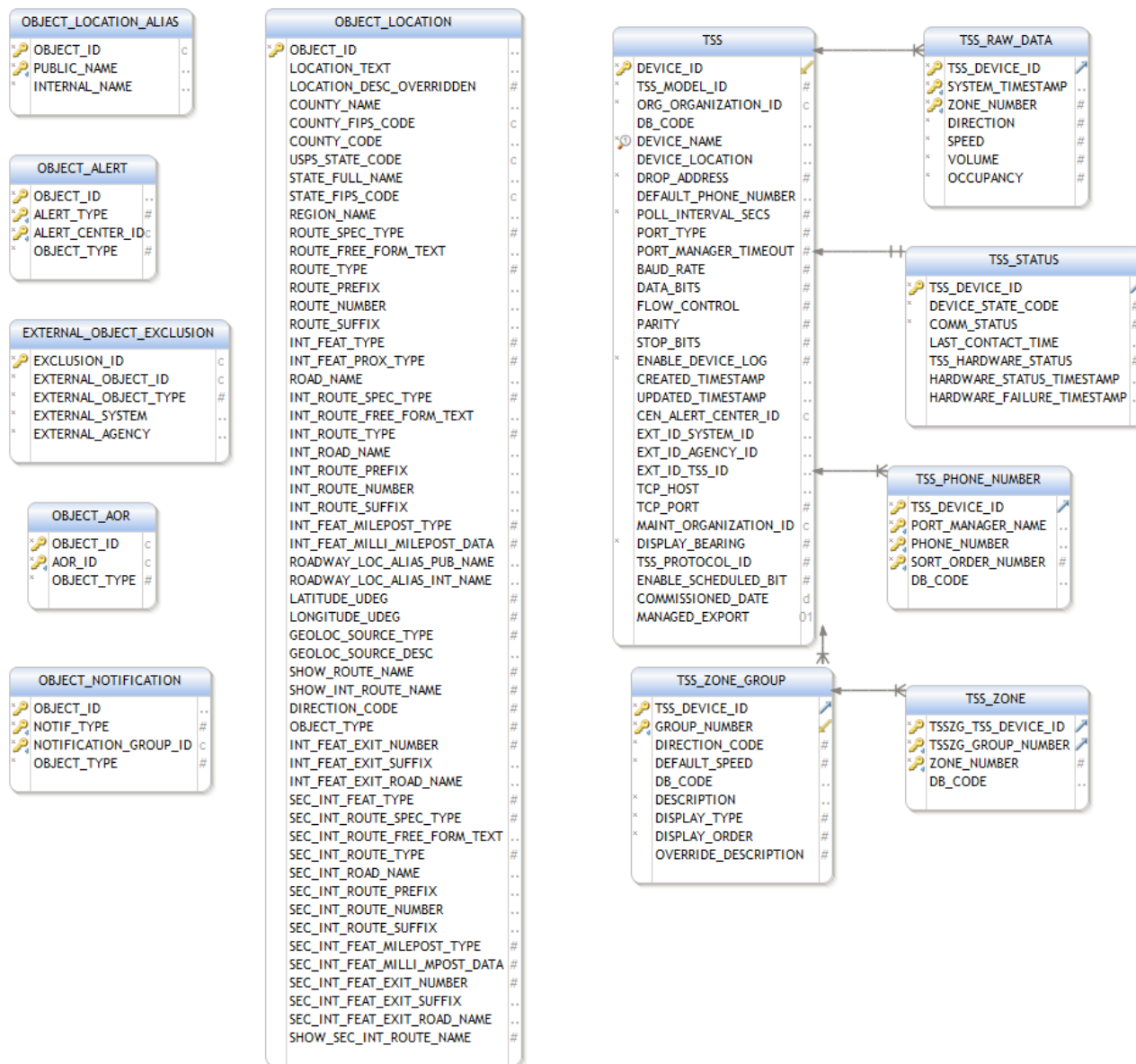


Figure 2-8. CHART_Live ERD, Page 1-4

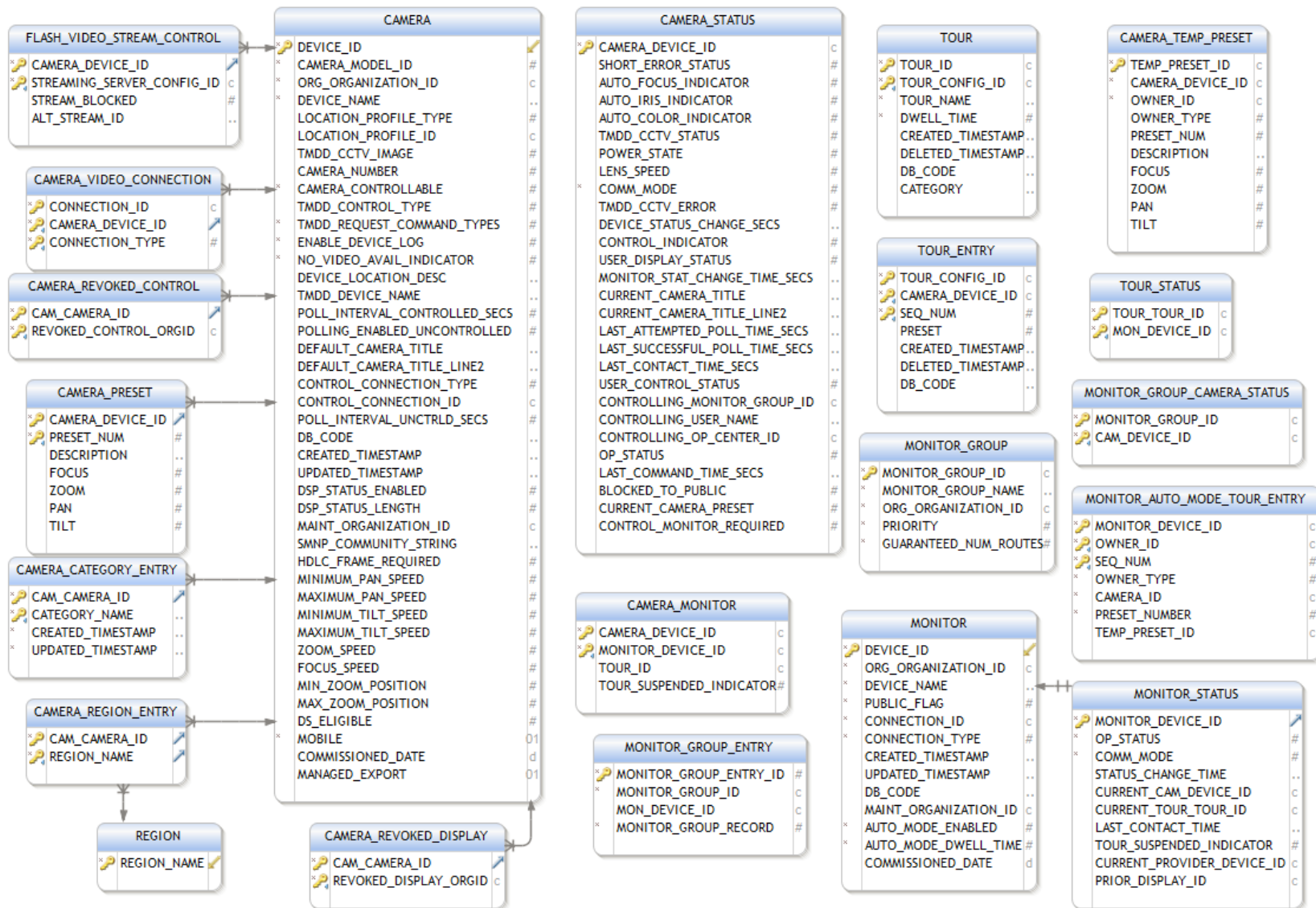


Figure 2-9. CHART_Live ERD, Page 1-5

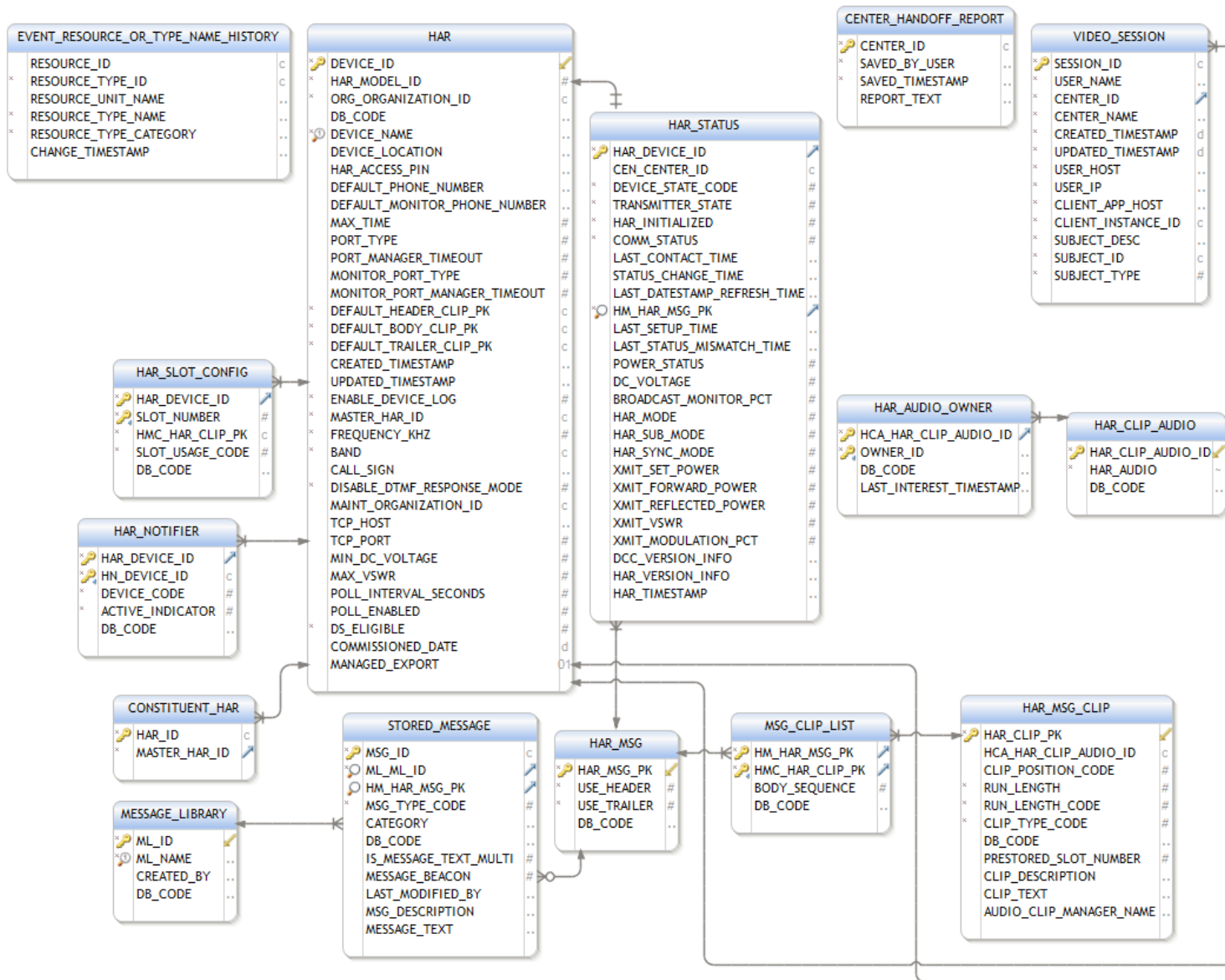


Figure 2-10. CHART_Live ERD, Page 2-1

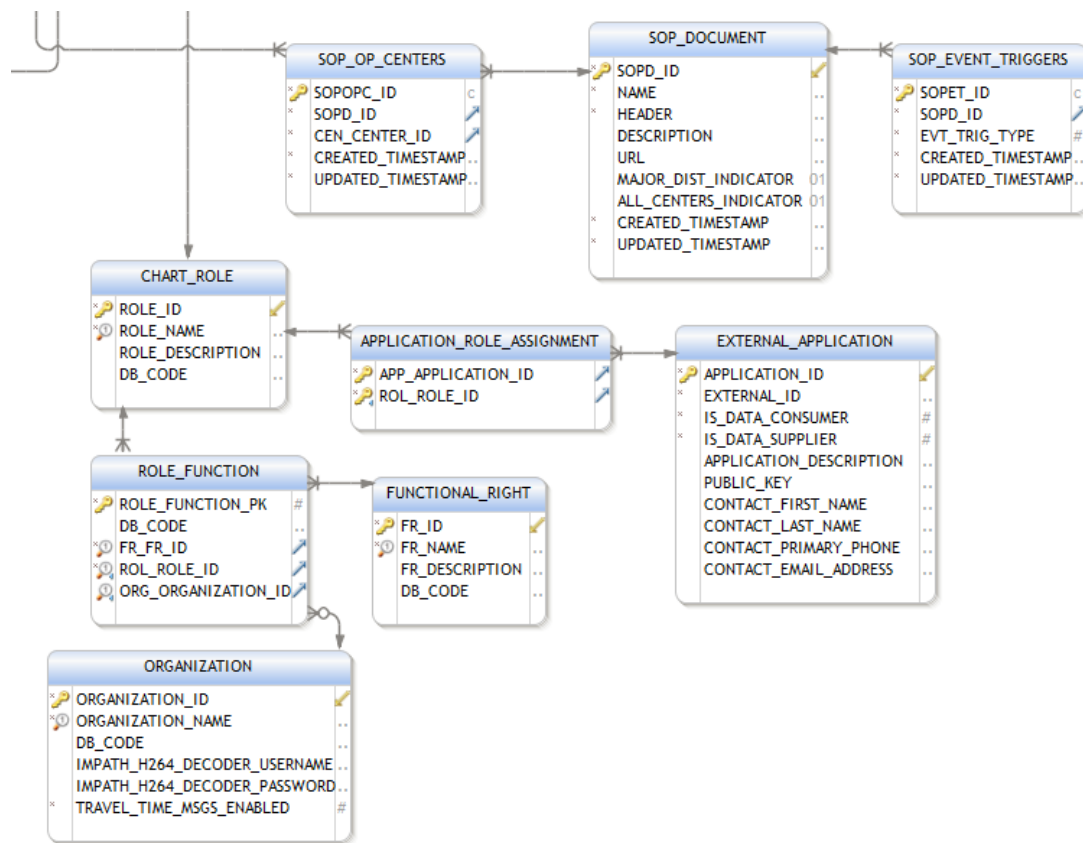


Figure 2-11. CHART_Live ERD, Page 2-2

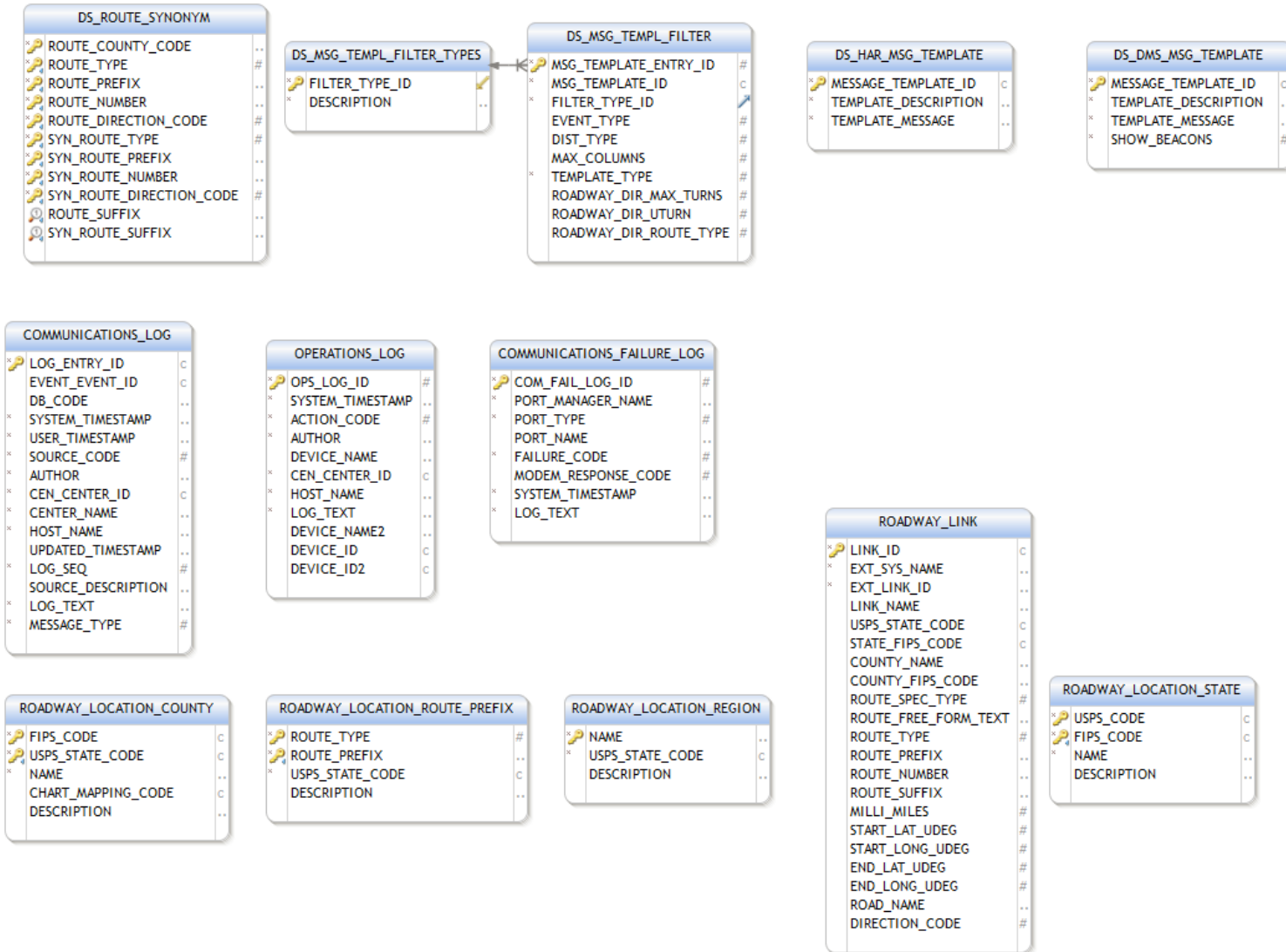


Figure 2-12. CHART_Live ERD, Page 2-3

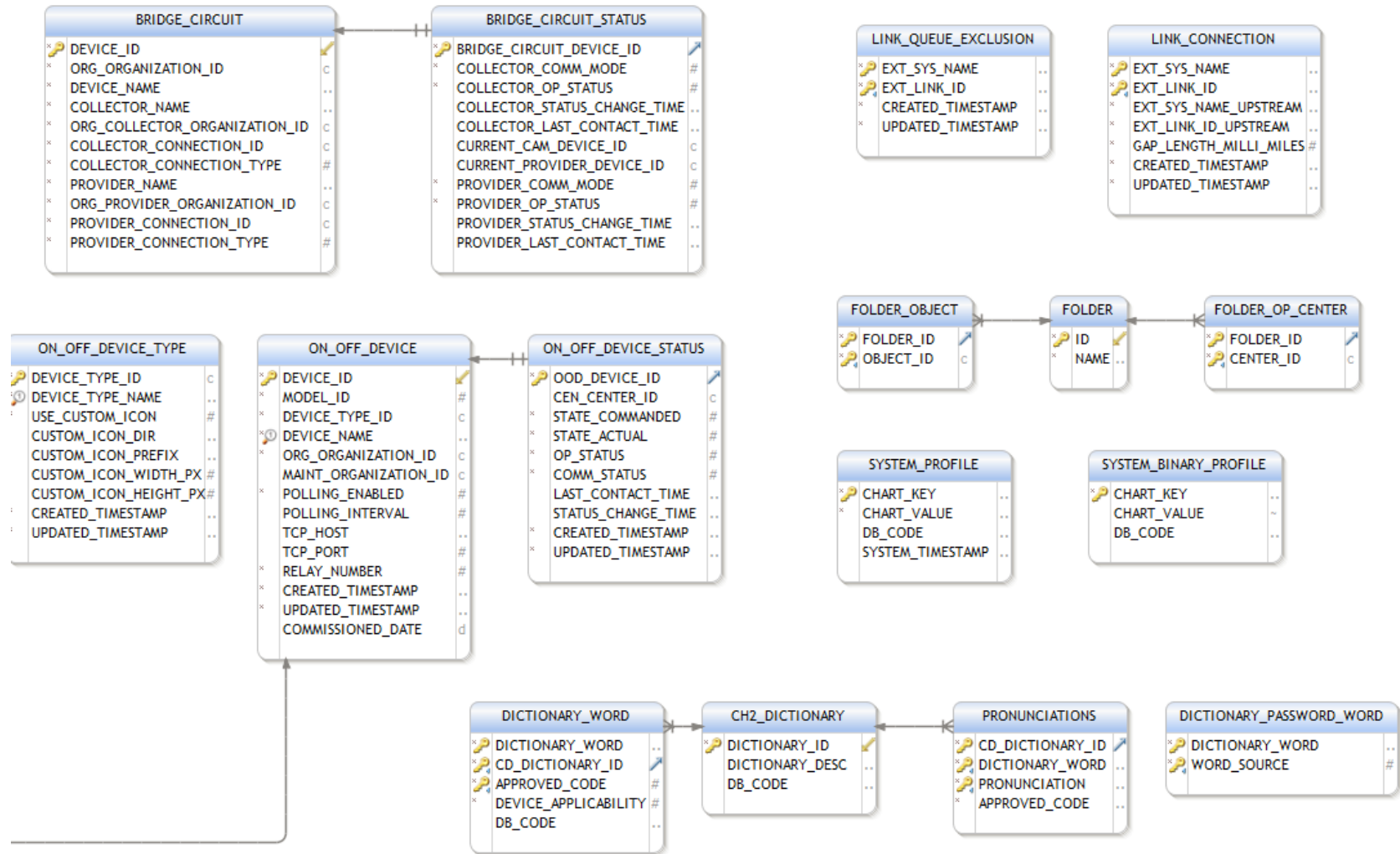


Figure 2-13. CHART_Live ERD, Page 2-4

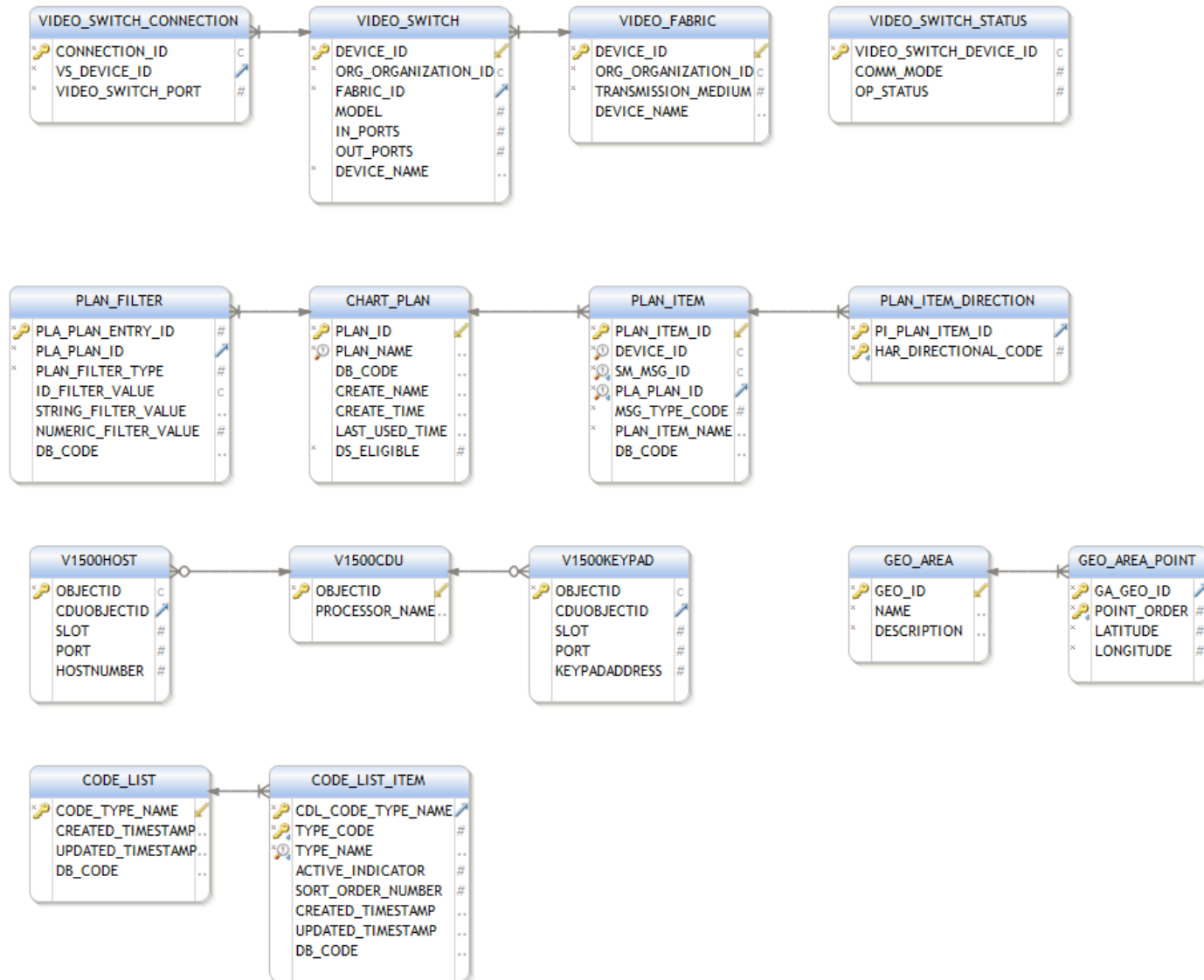


Figure 2-14. CHART_Live ERD, Page 2-5

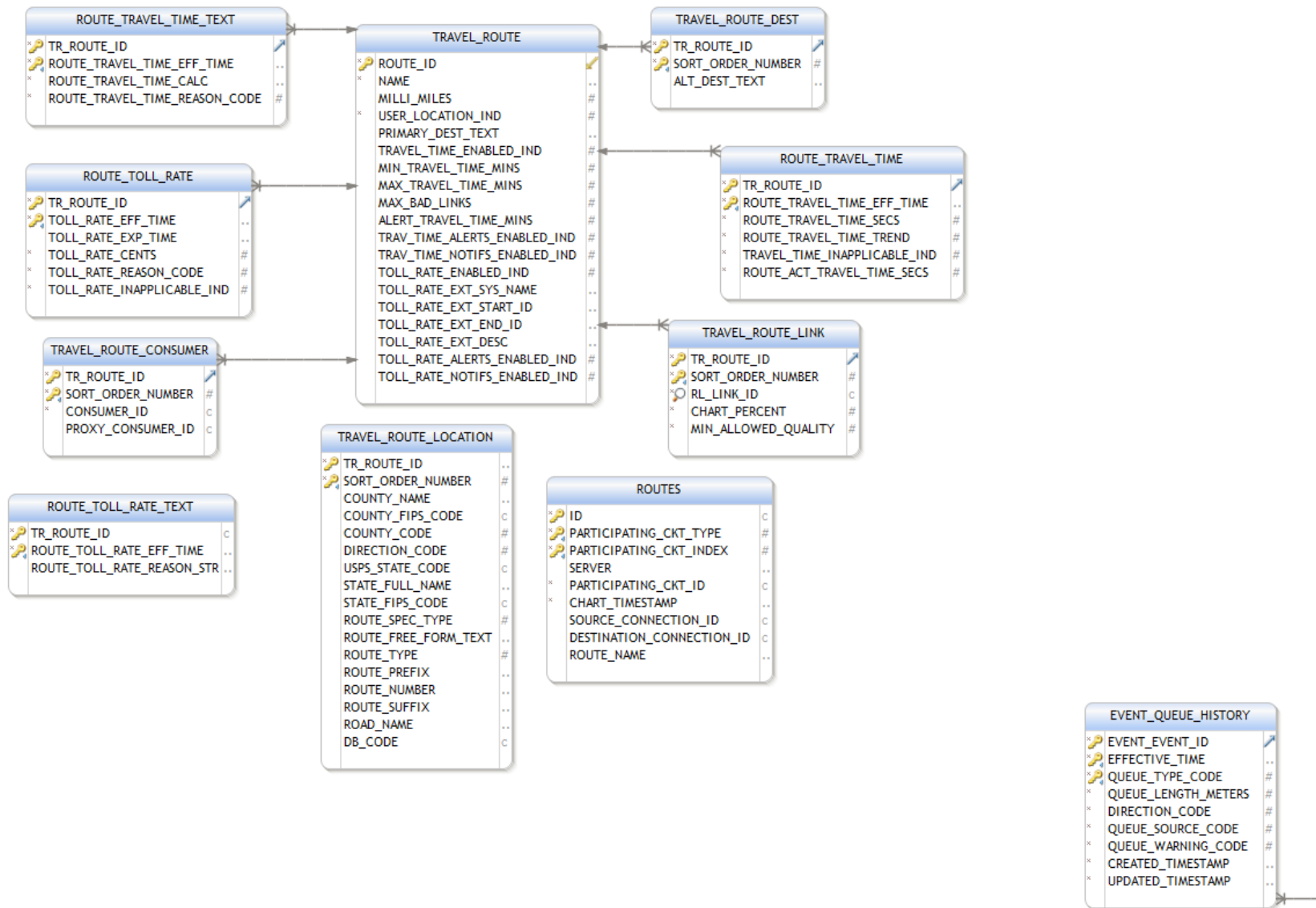


Figure 2-15. CHART_Live ERD, Page 3-1

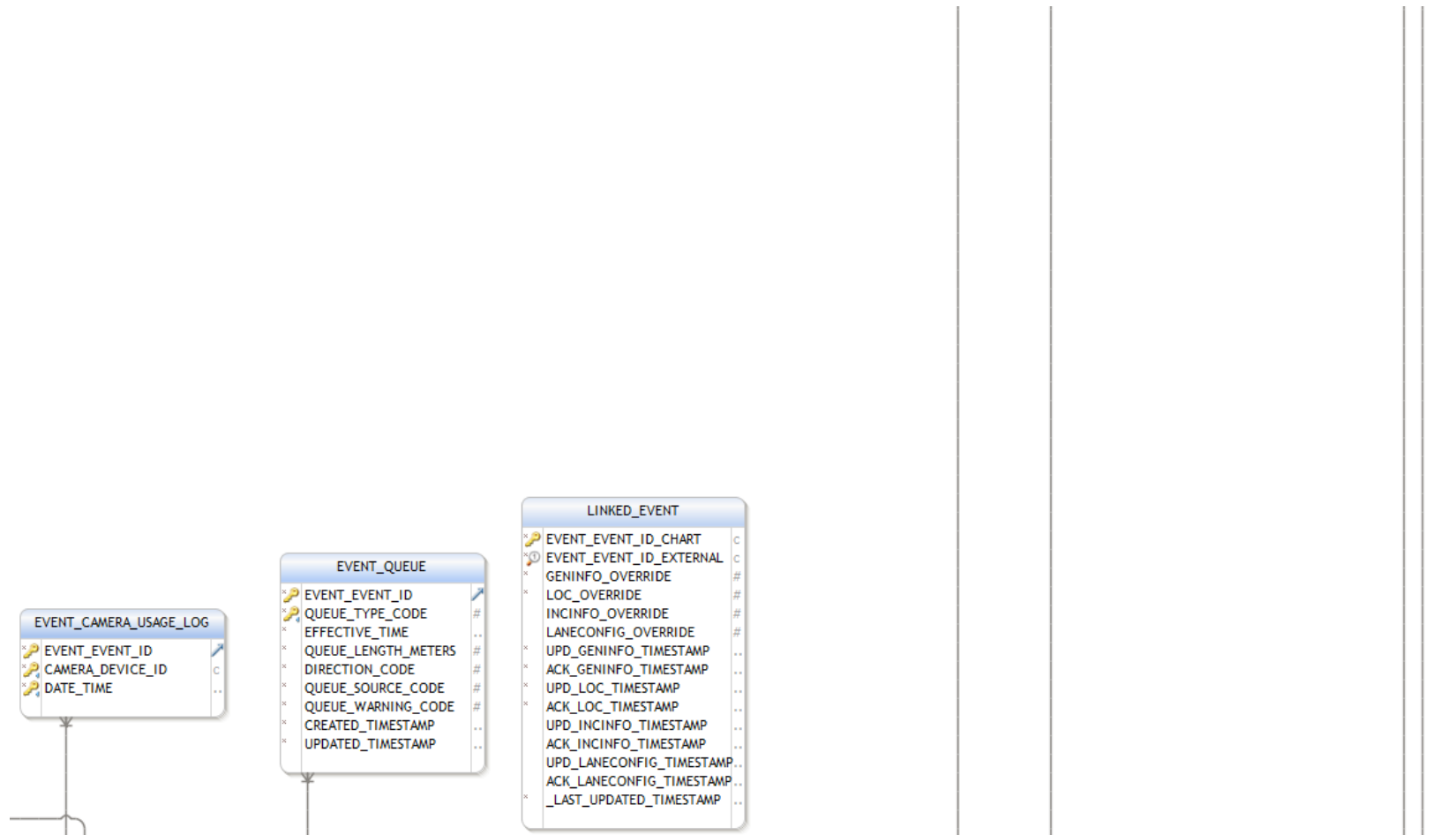


Figure 2-16. CHART_Live ERD, Page 3-2

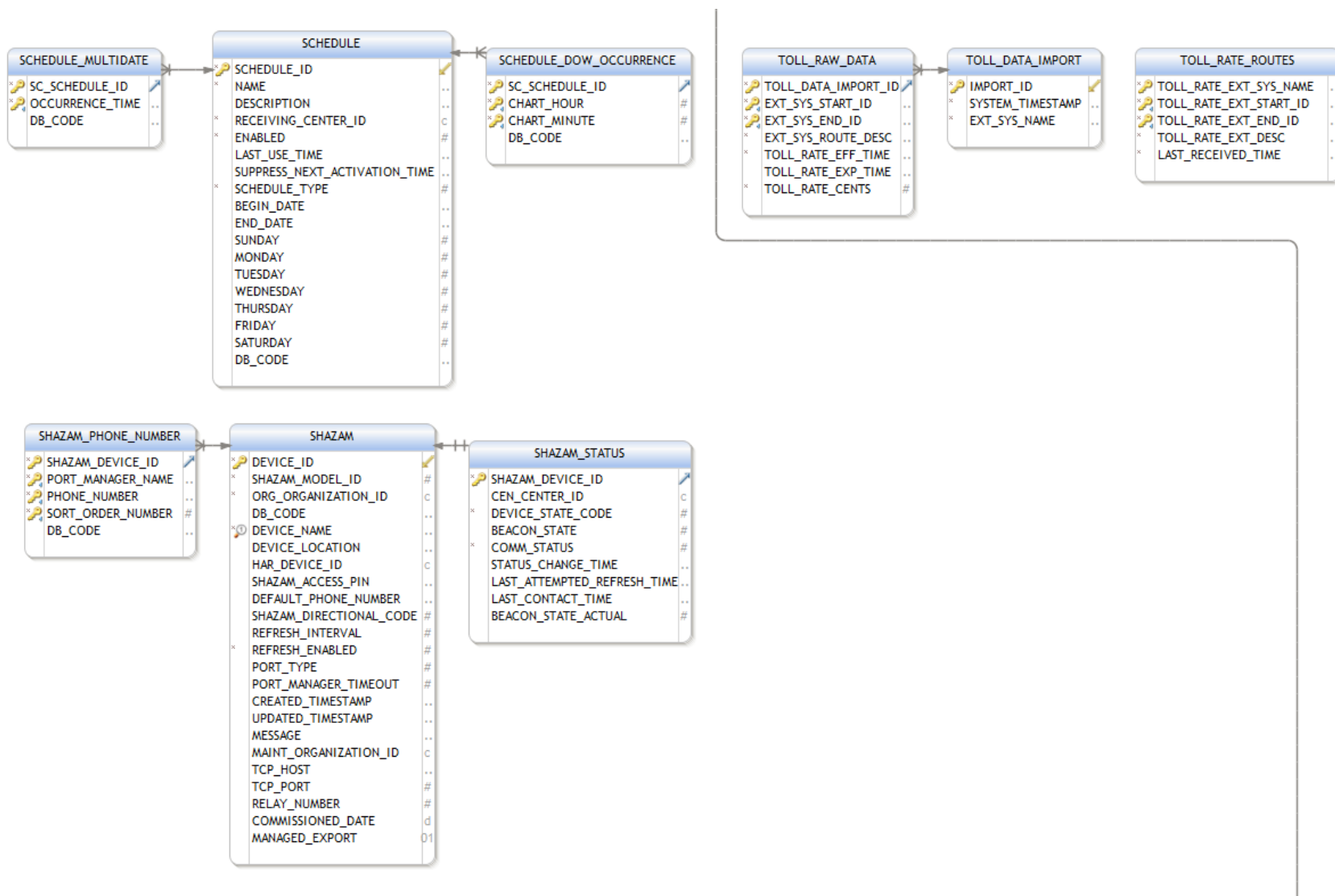


Figure 2-17. CHART_Live ERD, Page 3-3

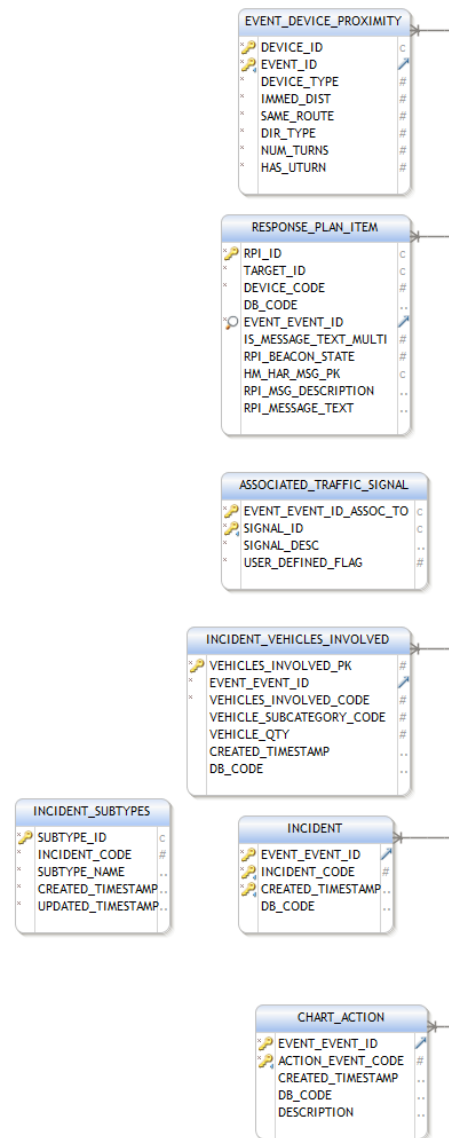


Figure 2-20. CHART_Live ERD, Page 4-1

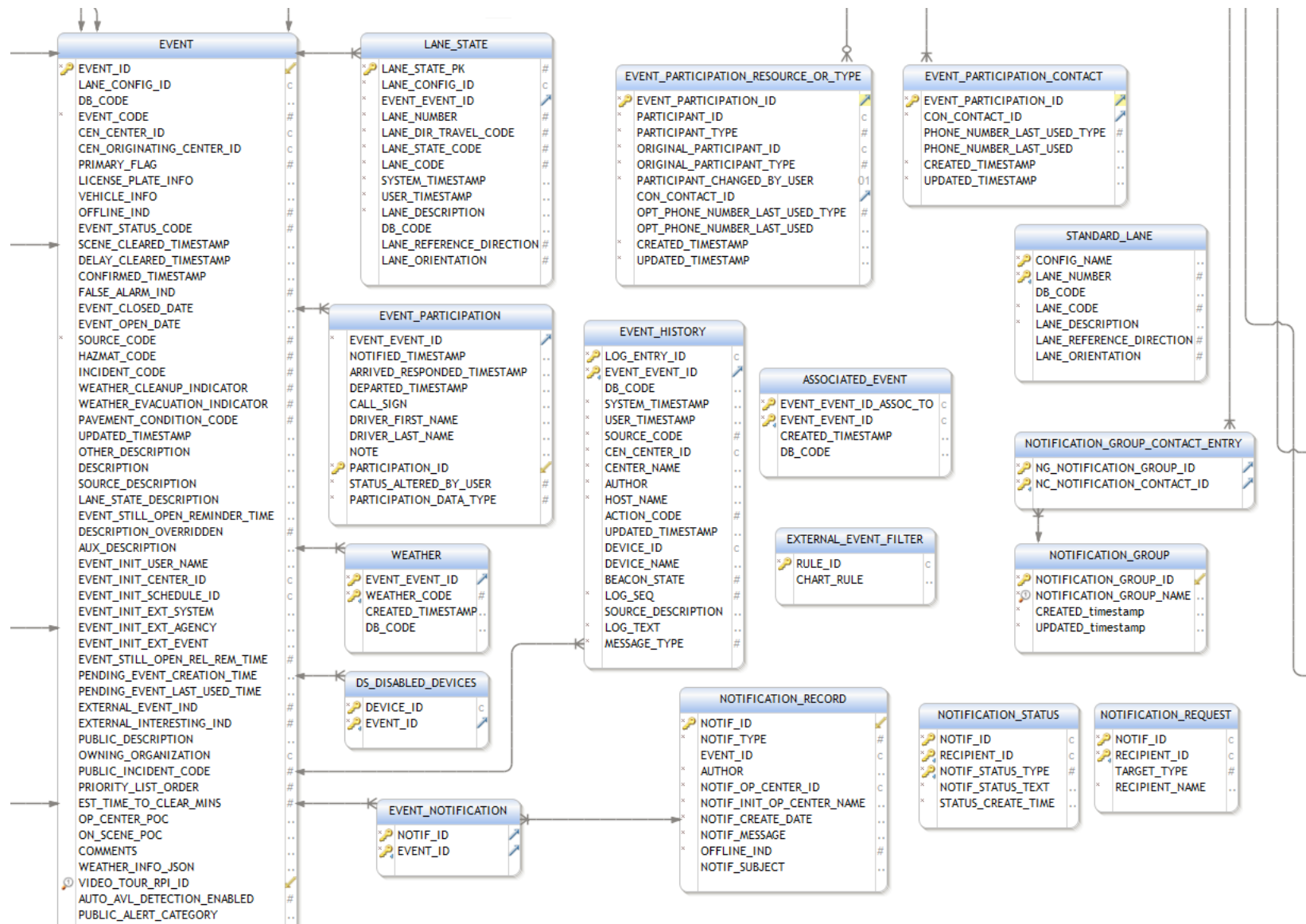


Figure 2-19. CHART_Live ERD, Page 4-2

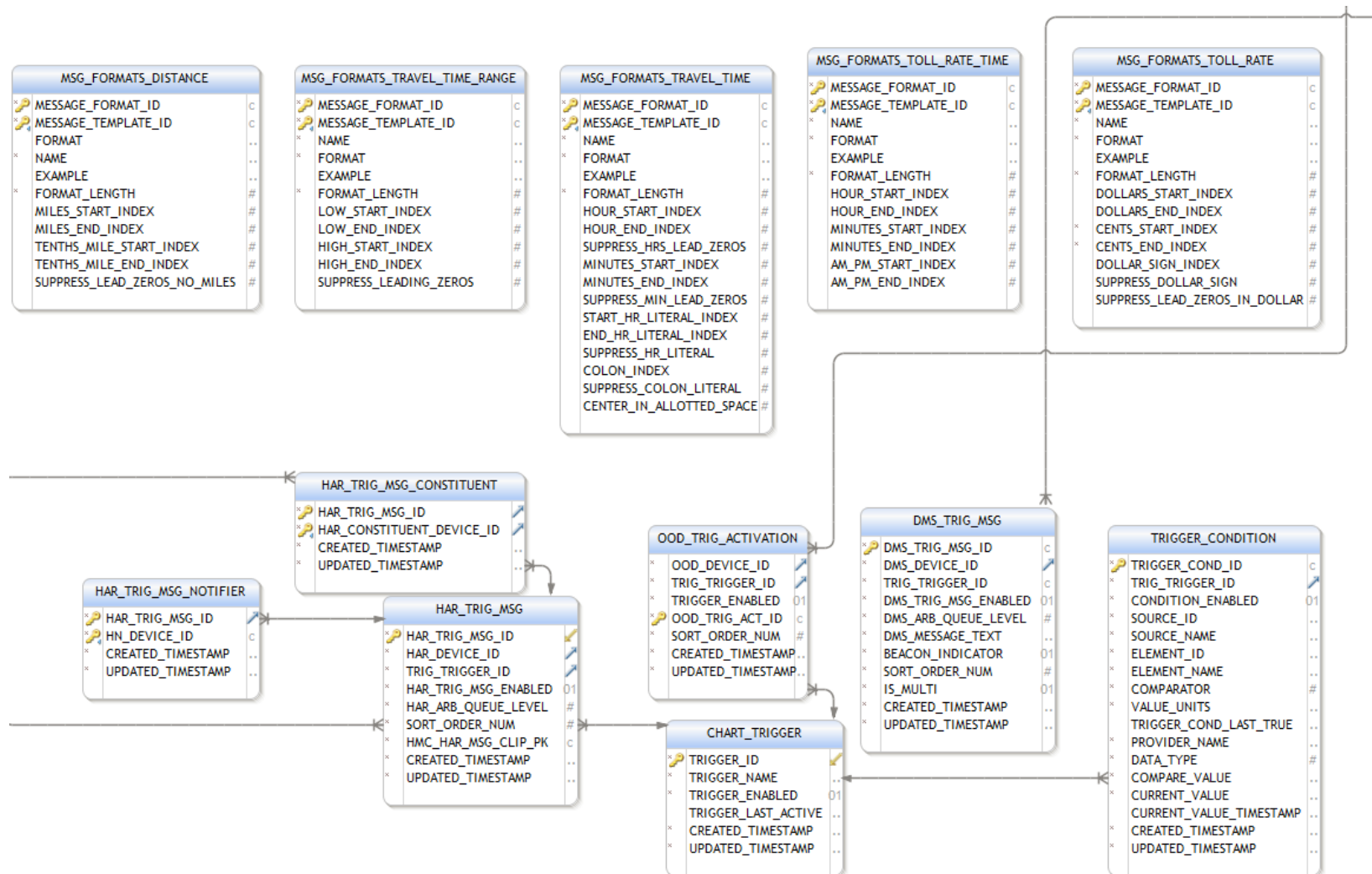


Figure 2-20. CHART_Live ERD, Page 4-3

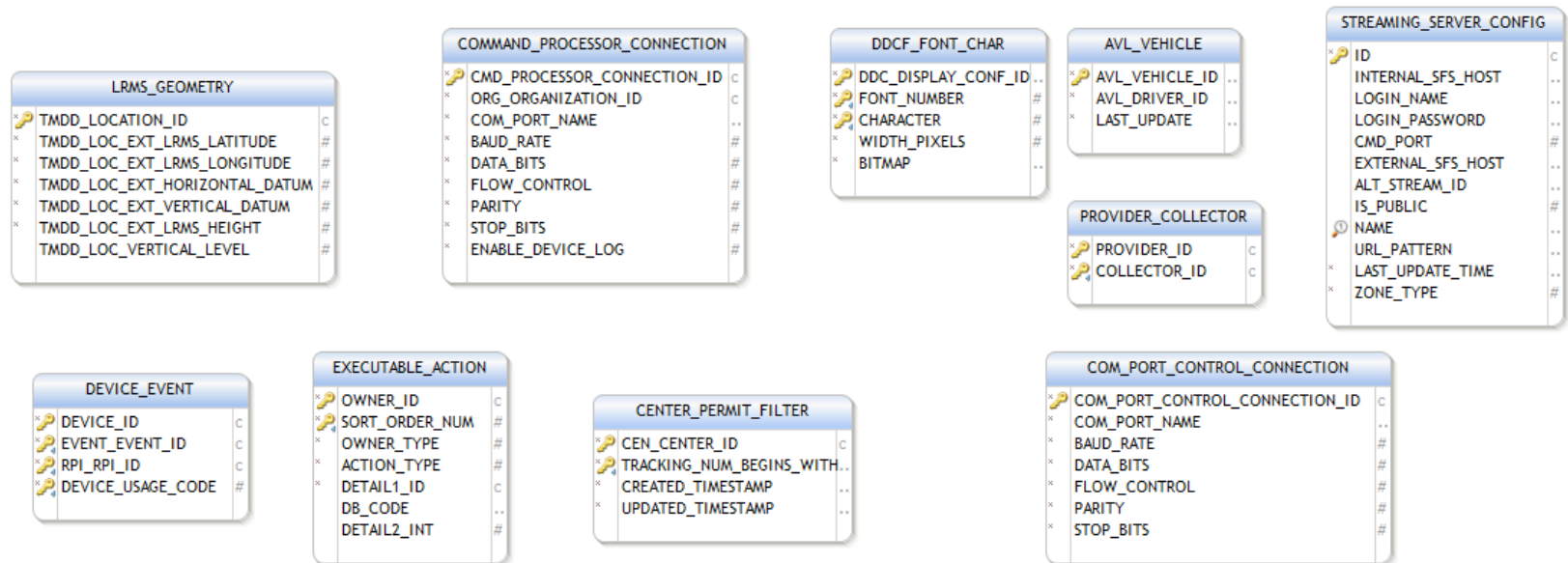


Figure 2-21. CHART_Live ERD, Page 4-4

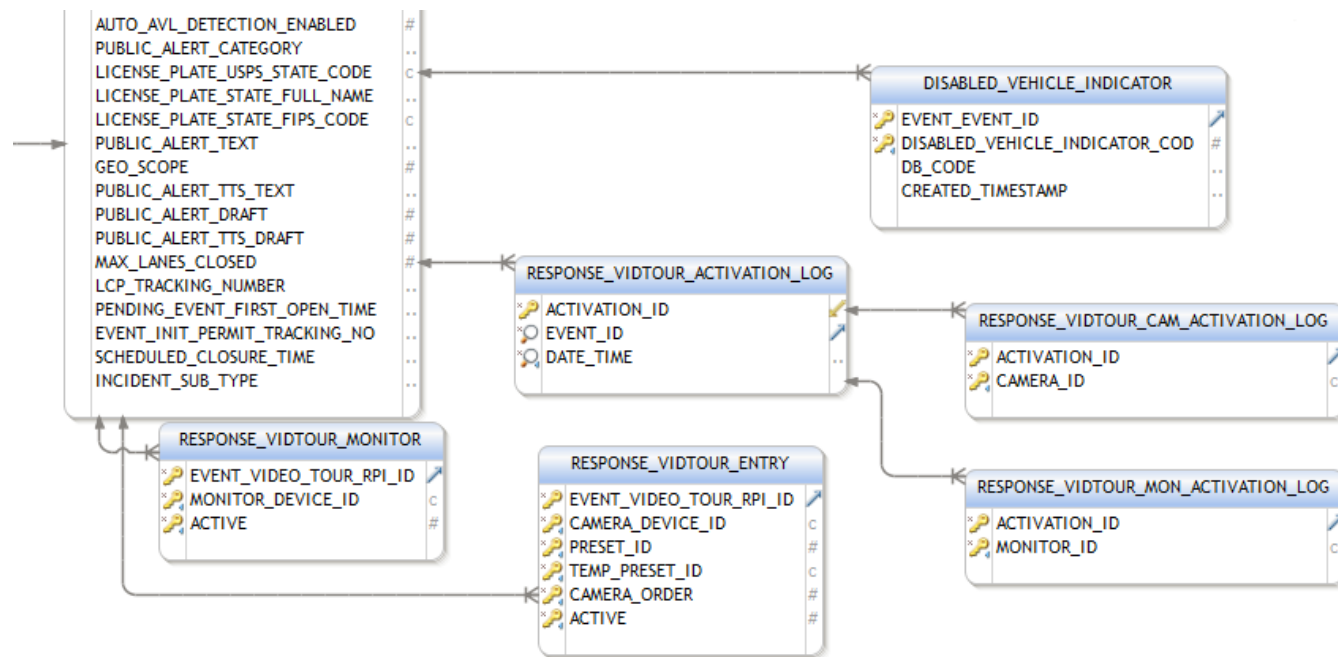


Figure 2-22. CHART_Live ERD, Page 5-2

2.4.1.2.2.2 CHART Archive Database Entity Relationship Diagram (ERD)

The CHART ATMS CHART_Archive Database entity relationship diagram for R16 is shown below in the ten figures that follow, in Figure 2-26 through Figure 2-35. Figure 2-26 is a visual table of contents into the remaining figures. The remaining figures should be mentally arranged into a grid three images wide (numbered 1-3) and three images tall (numbered 0-2), if desired to follow tables that had to be split across pages and connector lines which transverse between pages. Figure 2-27 is in the upper left, with Figure 2-28 and Figure 2-29 to the right, with Figure 2-30 starting the second row. The Table Definition Report sections that follow describe the changes that are made for R16.



04/21/2016

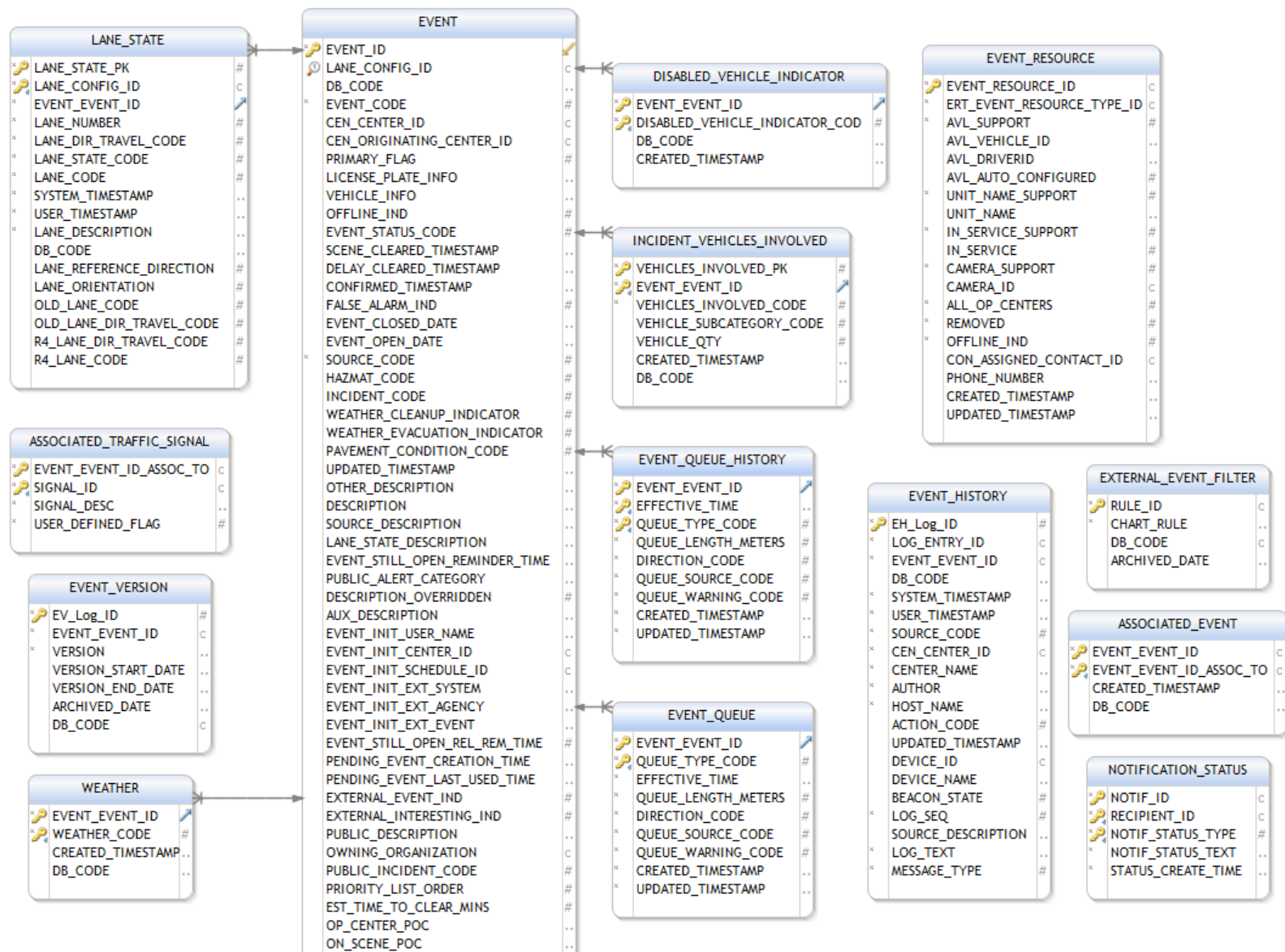


Figure 2-24. CHART_Archive ERD, Page 1-1

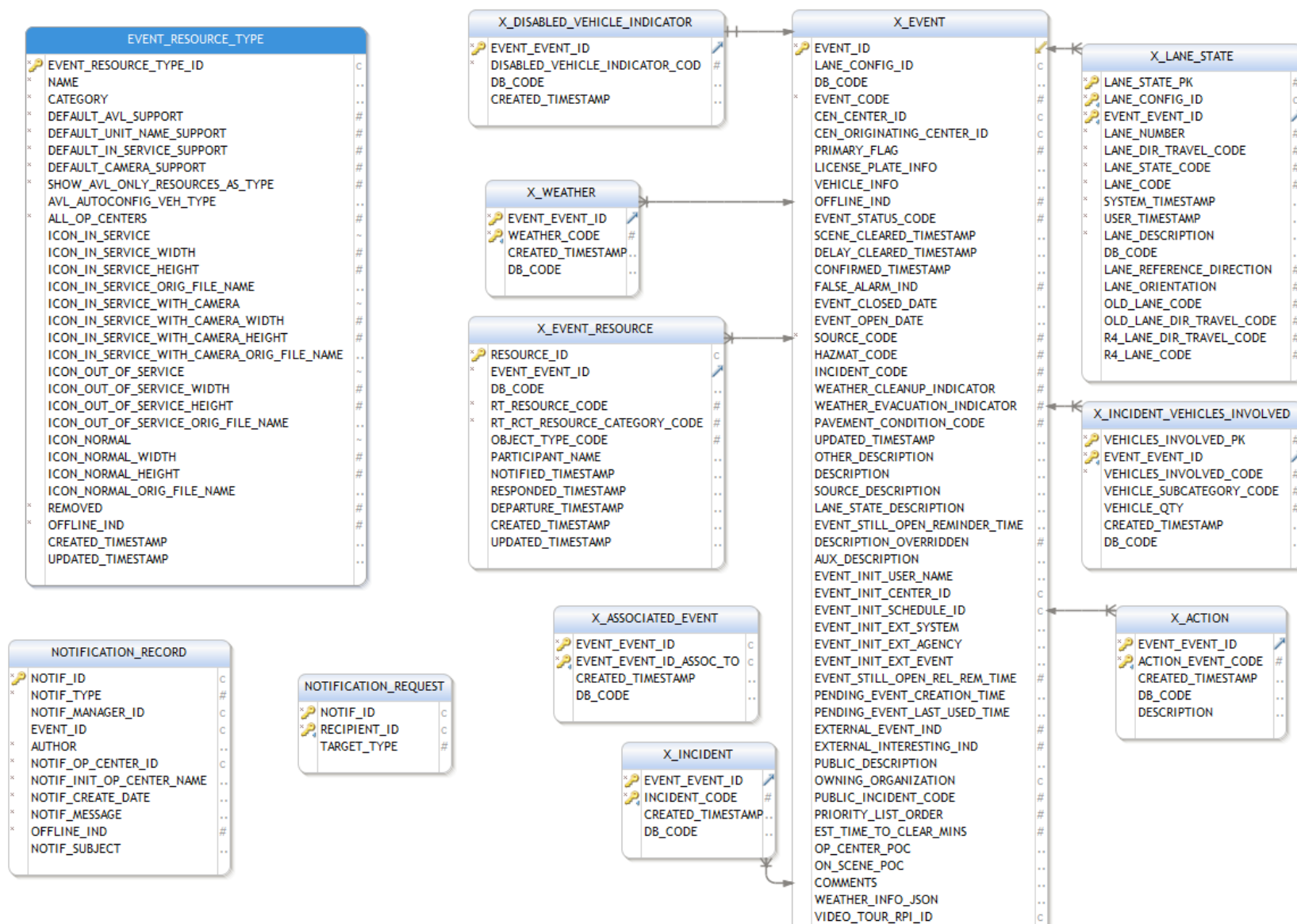


Figure 2-25. CHART_Archive ERD, Page 1-2

X_OBJECT_LOCATION	
X_Object_Location_log_ID	#
OBJECT_ID	..
LOCATION_TEXT	..
LOCATION_DESC_OVERRIDDEN	#
COUNTY_NAME	..
COUNTY_FIPS_CODE	C
COUNTY_CODE	..
USPS_STATE_CODE	C
STATE_FULL_NAME	..
STATE_FIPS_CODE	C
REGION_NAME	..
ROUTE_SPEC_TYPE	#
ROUTE_FREE_FORM_TEXT	..
ROUTE_TYPE	#
ROUTE_PREFIX	..
ROUTE_NUMBER	..
ROUTE_SUFFIX	..
INT_FEAT_TYPE	#
INT_FEAT_PROX_TYPE	#
ROAD_NAME	..
INT_ROUTE_SPEC_TYPE	#
INT_ROUTE_FREE_FORM_TEXT	..
INT_ROUTE_TYPE	#
INT_ROAD_NAME	..
INT_ROUTE_PREFIX	..
INT_ROUTE_NUMBER	..
INT_ROUTE_SUFFIX	..
INT_FEAT_MILEPOST_TYPE	#
INT_FEAT_MILLI_MILEPOST_DATA	#
ROADWAY_LOC_ALIAS_PUB_NAME	..
ROADWAY_LOC_ALIAS_INT_NAME	..
LATITUDE_UDEG	#
LONGITUDE_UDEG	#
GEOLOC_SOURCE_TYPE	#
GEOLOC_SOURCE_DESC	..
SHOW_ROUTE_NAME	#
SHOW_INT_ROUTE_NAME	#
DIRECTION_CODE	#
OBJECT_TYPE	#
INT_FEAT_EXIT_NUMBER	#
INT_FEAT_EXIT_SUFFIX	..
INT_FEAT_EXIT_ROAD_NAME	..
SEC_INT_FEAT_TYPE	#
SEC_INT_ROUTE_SPEC_TYPE	#
SEC_INT_ROUTE_FREE_FORM_TEXT	..
SEC_INT_ROUTE_TYPE	#
SEC_INT_ROAD_NAME	..
SEC_INT_ROUTE_PREFIX	..
SEC_INT_ROUTE_NUMBER	..
SEC_INT_ROUTE_SUFFIX	..
SEC_INT_FEAT_MILEPOST_TYPE	#
SEC_INT_FEAT_MILLI_MPOST_DATA	#
SEC_INT_FEAT_EXIT_NUMBER	..
SEC_INT_FEAT_EXIT_SUFFIX	..
SEC_INT_FEAT_EXIT_ROAD_NAME	..
SHOW_SEC_INT_ROUTE_NAME	#

OBJECT_LOCATION	
OBJECT_ID	..
LOCATION_TEXT	..
LOCATION_DESC_OVERRIDDEN	#
COUNTY_NAME	..
COUNTY_FIPS_CODE	C
COUNTY_CODE	..
USPS_STATE_CODE	C
STATE_FULL_NAME	..
STATE_FIPS_CODE	C
REGION_NAME	..
ROUTE_SPEC_TYPE	#
ROUTE_FREE_FORM_TEXT	..
ROUTE_TYPE	#
ROUTE_PREFIX	..
ROUTE_NUMBER	..
ROUTE_SUFFIX	..
INT_FEAT_TYPE	#
INT_FEAT_PROX_TYPE	#
ROAD_NAME	..
INT_ROUTE_SPEC_TYPE	#
INT_ROUTE_FREE_FORM_TEXT	..
INT_ROUTE_TYPE	#
INT_ROAD_NAME	..
INT_ROUTE_PREFIX	..
INT_ROUTE_NUMBER	..
INT_ROUTE_SUFFIX	..
INT_FEAT_MILEPOST_TYPE	#
INT_FEAT_MILLI_MILEPOST_DATA	#
ROADWAY_LOC_ALIAS_PUB_NAME	..
ROADWAY_LOC_ALIAS_INT_NAME	..
LATITUDE_UDEG	#
LONGITUDE_UDEG	#
GEOLOC_SOURCE_TYPE	#
GEOLOC_SOURCE_DESC	..
SHOW_ROUTE_NAME	#
SHOW_INT_ROUTE_NAME	#
DIRECTION_CODE	#
OBJECT_TYPE	#
INT_FEAT_EXIT_NUMBER	#
INT_FEAT_EXIT_SUFFIX	..
INT_FEAT_EXIT_ROAD_NAME	..
SEC_INT_FEAT_TYPE	#
SEC_INT_ROUTE_SPEC_TYPE	#
SEC_INT_ROUTE_FREE_FORM_TEXT	..
SEC_INT_ROUTE_TYPE	#
SEC_INT_ROAD_NAME	..
SEC_INT_ROUTE_PREFIX	..
SEC_INT_ROUTE_NUMBER	..
SEC_INT_ROUTE_SUFFIX	..
SEC_INT_FEAT_MILEPOST_TYPE	#
SEC_INT_FEAT_MILLI_MPOST_DATA	#
SEC_INT_FEAT_EXIT_NUMBER	..
SEC_INT_FEAT_EXIT_SUFFIX	..
SEC_INT_FEAT_EXIT_ROAD_NAME	..
SHOW_SEC_INT_ROUTE_NAME	#

GA_LOCATION	
OBJECT_ID	..
SERVER_NAME	..
DEVICE_TYPE	..
LOCATION_TEXT	..
LOCATION_DESC_OVERRIDDEN	#
COUNTY_NAME	..
COUNTY_FIPS_CODE	C
COUNTY_CODE	#
USPS_STATE_CODE	C
STATE_FULL_NAME	..
STATE_FIPS_CODE	C
REGION_NAME	..
ROUTE_SPEC_TYPE	#
ROUTE_FREE_FORM_TEXT	..
ROUTE_TYPE	#
ROUTE_PREFIX	..
ROUTE_NUMBER	..
ROUTE_SUFFIX	..
INT_FEAT_TYPE	#
INT_FEAT_PROX_TYPE	#
INT_FEAT_PROX_DIST	..
ROAD_NAME	..
INT_ROUTE_SPEC_TYPE	#
INT_ROUTE_FREE_FORM_TEXT	..
INT_ROUTE_TYPE	..
INT_ROAD_NAME	..
INT_ROUTE_PREFIX	..
INT_ROUTE_NUMBER	..
INT_ROUTE_SUFFIX	..
INT_FEAT_MILEPOST_TYPE	#
INT_FEAT_MILLI_MILEPOST_DATA	#
ROADWAY_LOC_ALIAS_PUB_NAME	..
ROADWAY_LOC_ALIAS_INT_NAME	..
LATITUDE_UDEG	#
LONGITUDE_UDEG	#
GEOLOC_SOURCE_TYPE	#
GEOLOC_SOURCE_DESC	..
SHOW_ROUTE_NAME	#
SHOW_INT_ROUTE_NAME	#
DIRECTION_CODE	#
OBJECT_TYPE	#

Figure 2-26. CHART_Archive ERD, Page 1-3

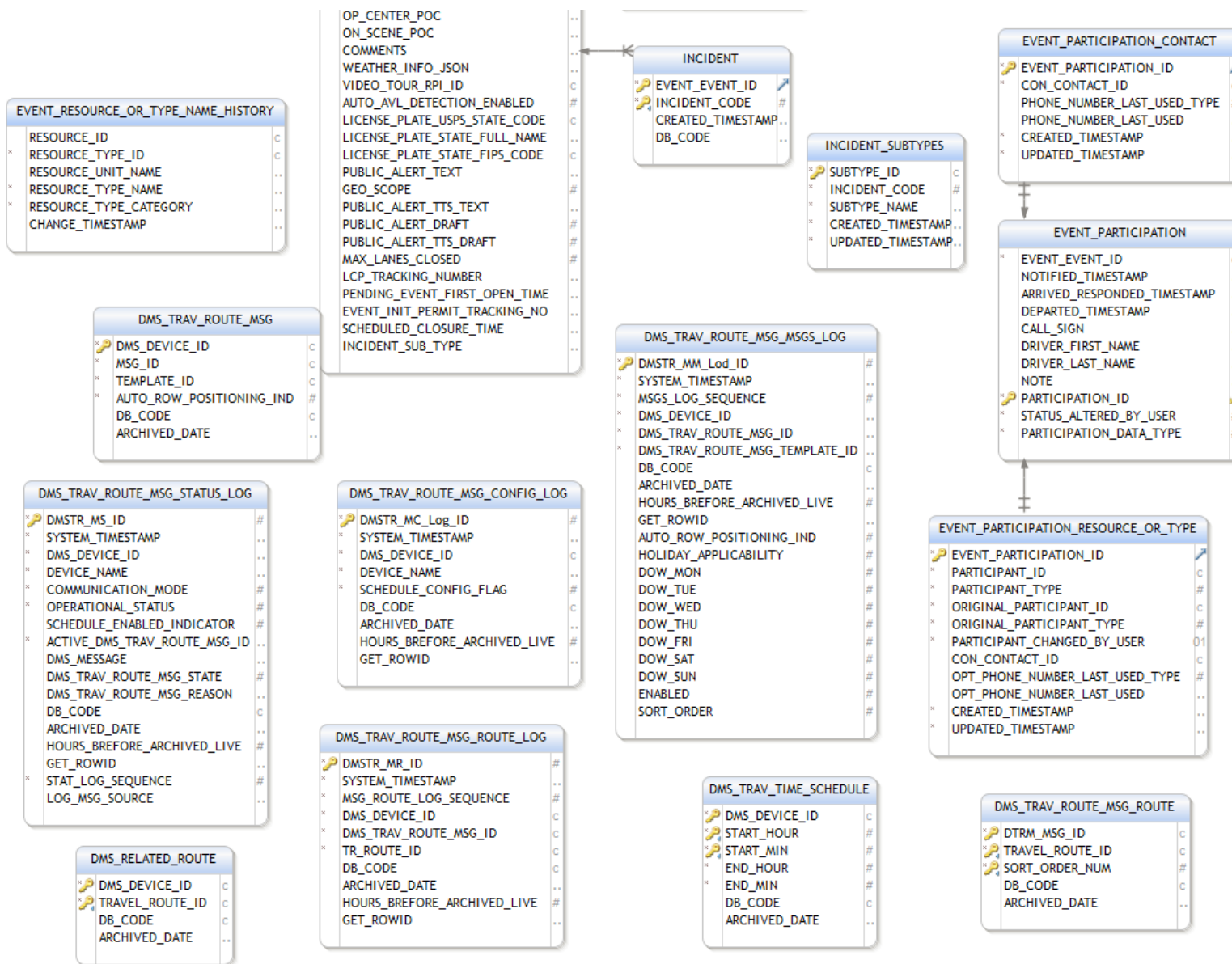


Figure 2-27. CHART_Archive ERD, Page 2-1

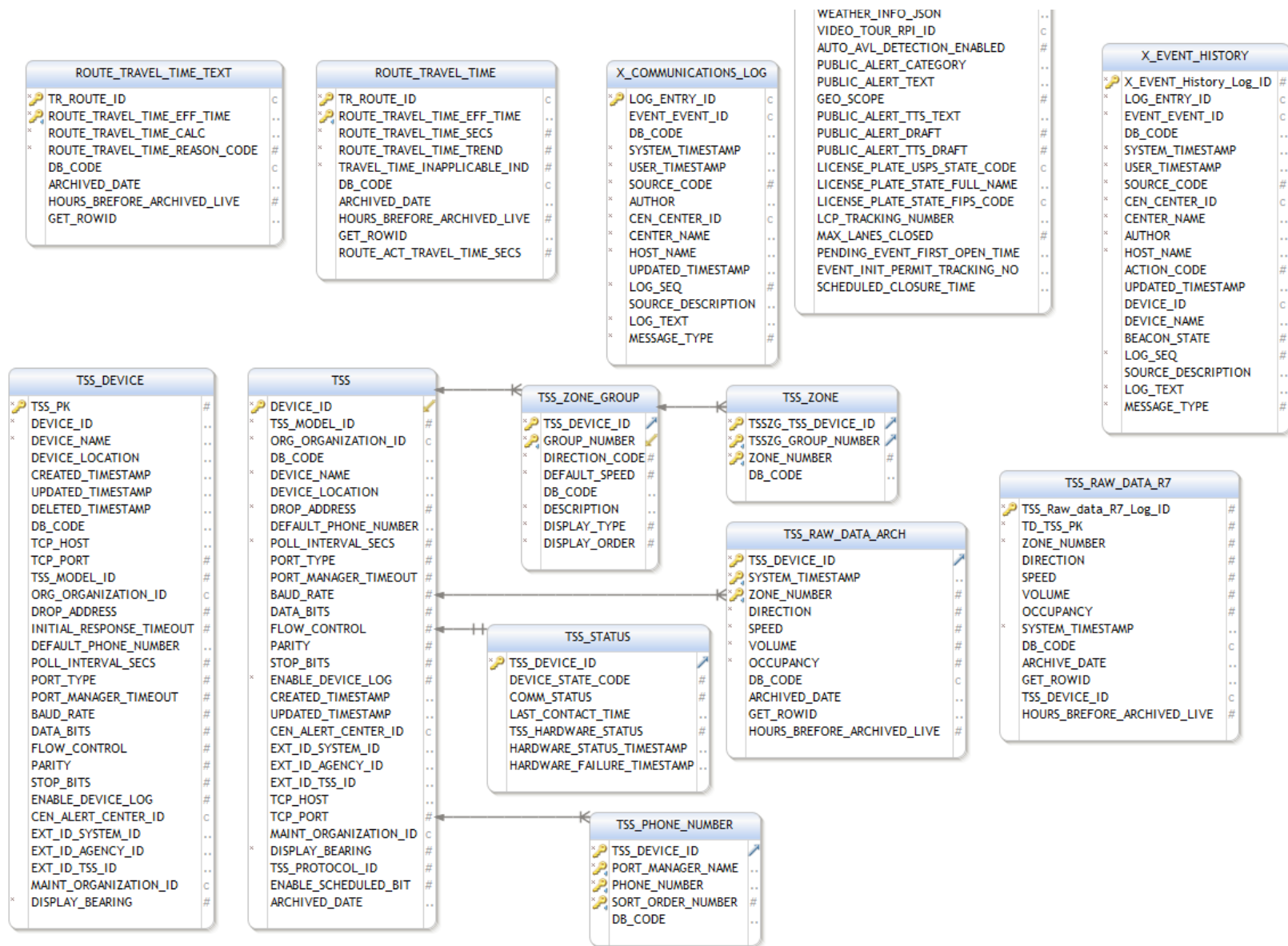


Figure 2-28. CHART_Archive ERD, Page 2-2

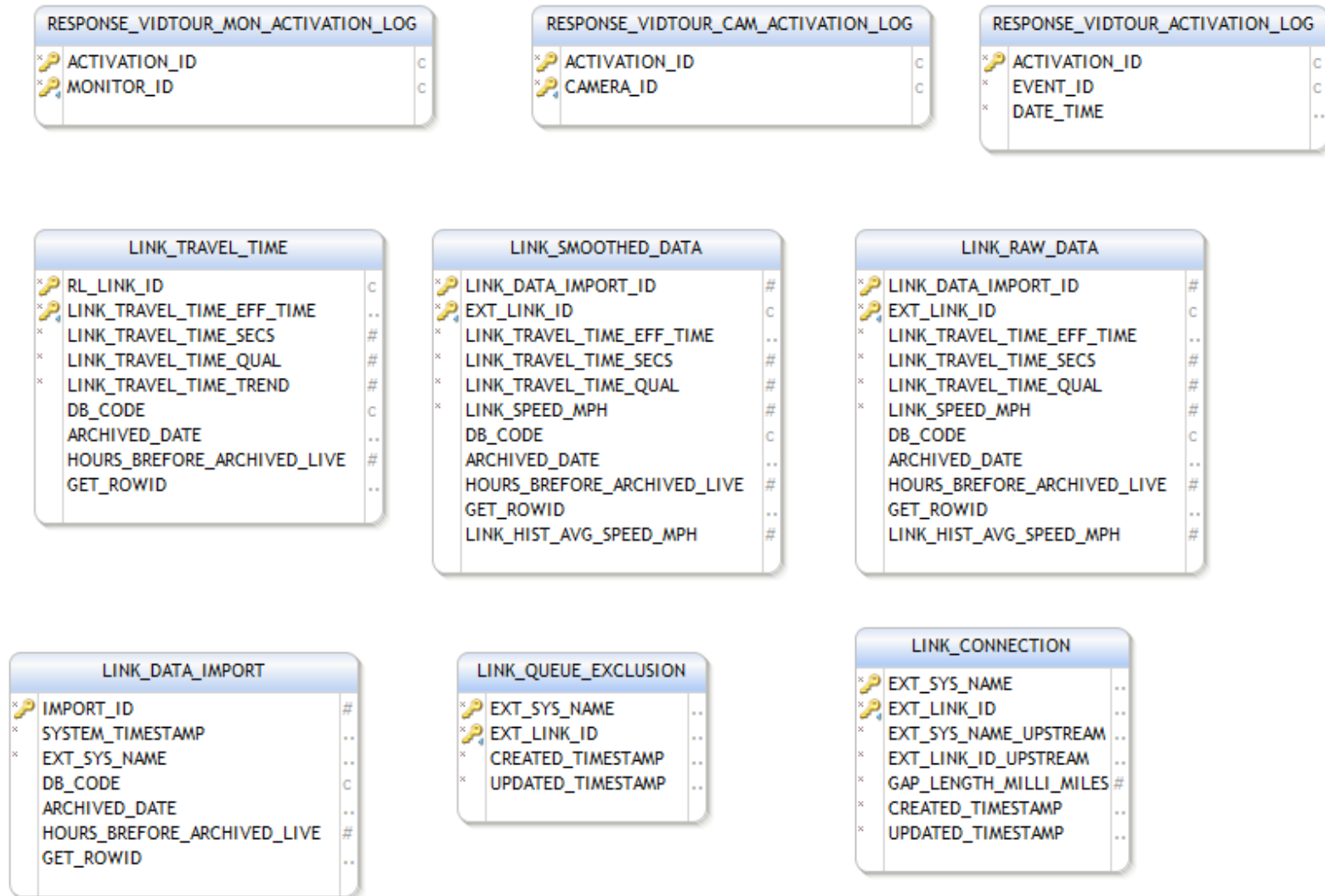


Figure 2-29. CHART_Archive ERD, Page 2-3

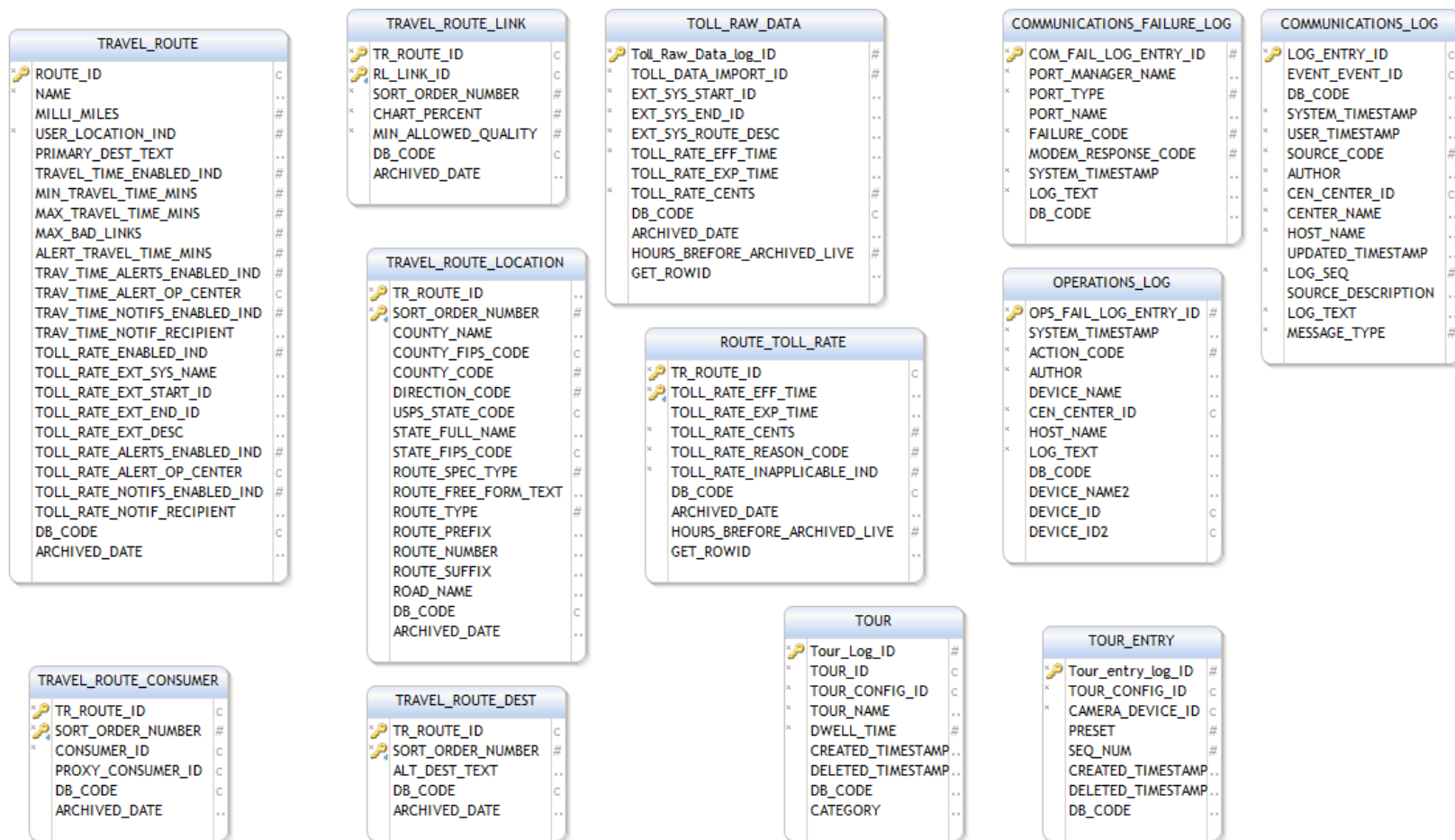


Figure 2-30. CHART_Archive ERD, Page 3-1

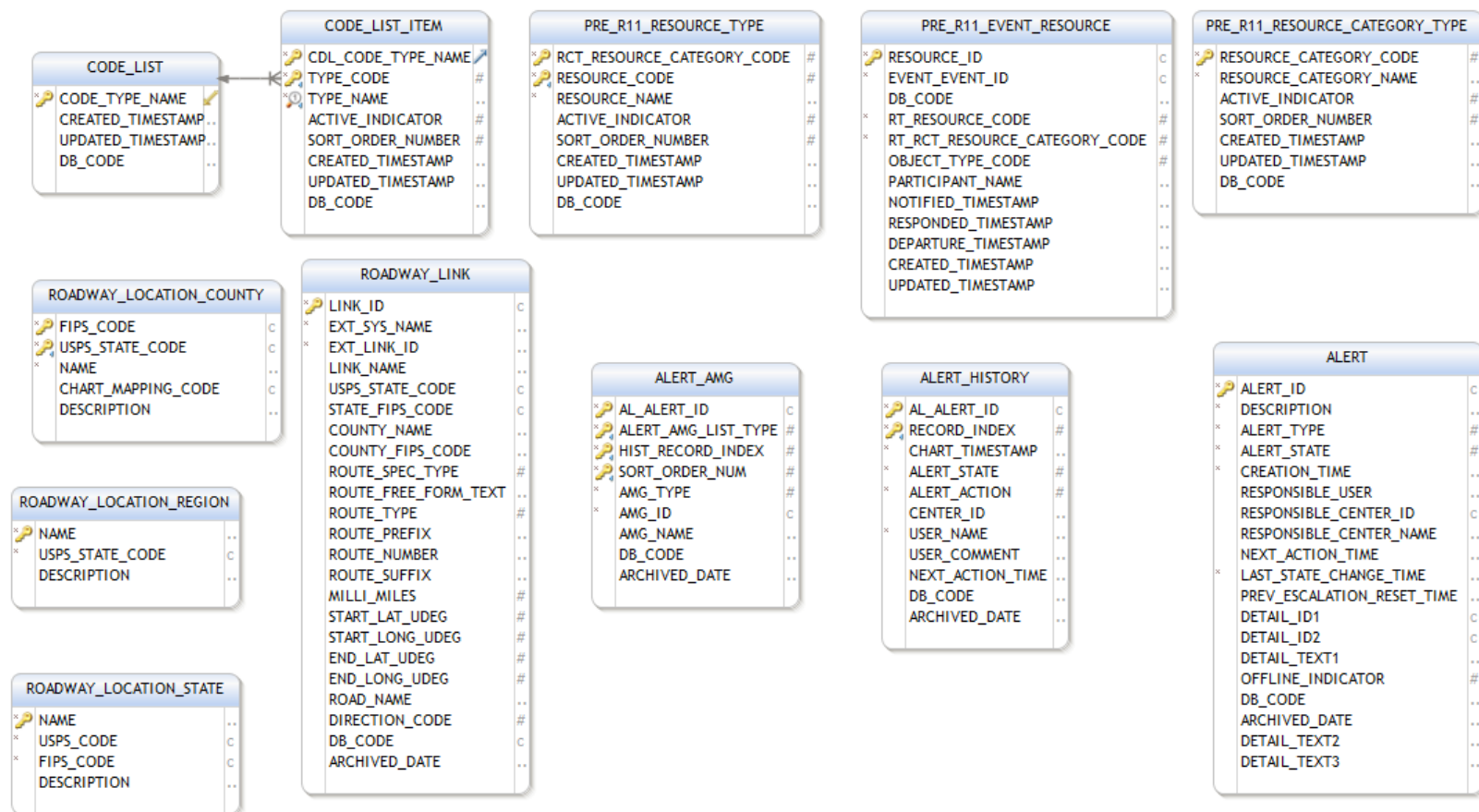


Figure 2-31. CHART_Archive ERD, Page 3-2

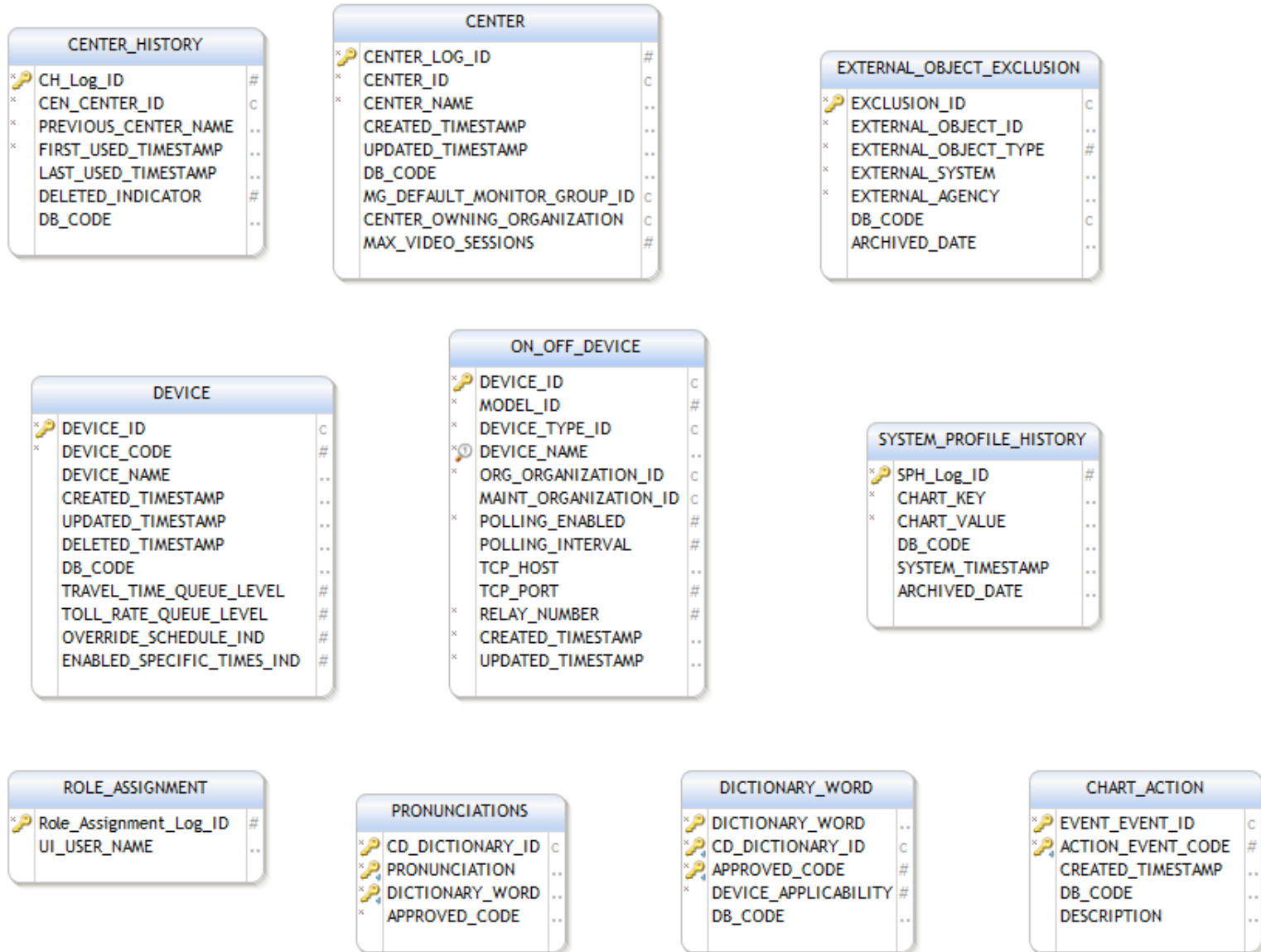


Figure 2-32. CHART_Archive ERD, Page 3-3

2.4.1.2.2.3 Function to Entity Matrix Report

The Create, Retrieve, Update, Delete (CRUD) matrix cross-references business functions to entities and shows the use of the entities by those functions. This report is generated as part of the CHART O&M Guide.

2.4.1.2.2.4 Table Definition Report –

In tables shown below:

- Deleted columns/constraints marked with a minus sign (“-”)
- Modified columns/constraints marked with an asterisk (“*”)
- New columns/constraints marked with a plus sign (“+”)

2.4.1.2.2.4.1 Database Changes for the Device Commissioned Date Feature

2.4.1.2.2.4.1.1 CHART ATMS DB

The R16 Device Commissioned Date feature adds a new COMMISSIONED_DATE column to several existing tables:

DMS Table (Modified)

HAR Table (Modified)

SHAZAM Table (Modified)

TSS Table (Modified)

CAMERA Table (Modified)

MONITOR Table (Modified)

ON_OFF_DEVICE Table (Modified)

The new column (applied to all of the above tables is):

+COMMISSIONED_DATE	DATE	NULL
--------------------	------	------

2.4.1.2.2.4.2 Database Changes for the CCTV Export Enhancements

2.4.1.2.2.4.2.1 CHART ATMS DB

The R16 CCTV Export Enhancements feature adds a new column to the CAMERA table, a new column to the STREAMING_SERVER_CONFIG table and a new table to store optional camera categories for cameras.

CAMERA Table (Modified)

+MANAGED_EXPORT	BIT	NOT NULL
-----------------	-----	----------

STREAMING_SERVER_CONFIG Table (Modified)

+ZONE_TYPE

NUMERIC 3

NOT NULL

CAMERA_CATEGORY_ENTRY Table (New)

This new table will store any optional camera categories for cameras in the ATMS.

+CAM_CAMERA_ID

CHAR(32)

NOT NULL

+CATEGORY_NAME

VARCHAR(50)

NOT NULL

Primary Key (CAM_CAMERA_ID, CATEGORY_NAME).

Foreign Key (CAM_CAMERA_ID REFERENCES CAMERA.DEVICE_ID)

There are also new user rights added that can be used to control the export of cameras that have `MANAGED_EXPORT` set to 1 (true). Also, new user rights that can be used to control the export of streaming server info for cameras by streaming server zone type. The following new values are added to the `FUNCTIONAL_RIGHT` table:

FR_ID	FR_NAME	FR_DESCRIPTION
174	ExportManagedCamera	Allows the holder (External Client) to export managed Camera devices.
175	ExportPublicSFSData	Allows the holder (External Client) to export SFS data belonging to the Public SFS zone type.
176	ExportInternalSFSData	Allows the holder (External Client) to export SFS data belonging to the Internal SFS zone type.
177	ExporSWGISFSData	Allows the holder (External Client) to export SFS data belonging to the SWGI SFS zone type.
178	ExportMviewSFSData	Allows the holder (External Client) to export SFS data belonging to the MVIEW SFS zone type.

Values will also be added to the system_profile to categorize these new user rights as follows.

CHART_KEY	CHART_VALUE
chartlite.functionalRightCategory.174	Video
chartlite.functionalRightCategory.175	Video
chartlite.functionalRightCategory.176	Video
chartlite.functionalRightCategory.177	Video
chartlite.functionalRightCategory.178	Video

2.4.1.2.2.4.3 Database Changes for PR ATMS-868

2.4.1.2.2.4.3.1 CHART ATMS DB

The change for PR ATMS-868 adds a new column to several existing tables. The column is named `MANAGED_EXPORT` and is added to the following tables:

DMS Table (Modified)

HAR Table (Modified)

SHAZAM Table (Modified)

TSS Table (Modified)

The new column (applied to all of the above tables) is:

+MANAGED_EXPORT

BIT

NULL

There are also new user rights added that can be used to control the export of devices that have MANAGED_EXPORT set to 1 (true). The following new values are added to the FUNCTIONAL_RIGHT table:

FR_ID	FR_NAME	FR_DESCRIPTION
179	ExportManagedDMS	Allows the holder (External Client) to export managed DMS devices.
180	ExportManagedHAR	Allows the holder (External Client) to export managed HAR devices.
181	ExportManagedSHAZAM	Allows the holder (External Client) to export managed SHAZAM devices.
182	ExportManagedTSS	Allows the holder (External Client) to export managed TSS devices.

Values will also be added to the system_profile to categorize these new user rights as follows. Note that SHAZAM related rights are kept in the HAR category, as SHAZAM features utilize HAR user rights.

CHART_KEY	CHART_VALUE
chartlite.functionalRightCategory.179	DMS
chartlite.functionalRightCategory.180	HAR
chartlite.functionalRightCategory.181	HAR
chartlite.functionalRightCategory.182	TSS

2.4.1.2.2.4.4 Database Changes for the Incident Sub-Types

2.4.1.2.2.4.4.1 CHART ATMS DB

The R16 Incident Sub-Types feature adds a new table INCIDENT_SUBTYPES to store the list of pre-defined incident sub-types and a new column to the EVENT table to allow the optional assignment of an incident sub-type.

INCIDENT_SUBTYPES Table (New):

Rights: The CHART2_TRAFFIC_EVENT_ROLE user requires full C/R/U/D rights for this table.

This new table will store any incident sub-types pre-defined in ATMS.

INCIDENT_SUBTYPES Columns:

+ SUBTYPE_ID	CHAR(32)	NOT NULL
+ INCIDENT_CODE	NUMERIC(3,0)	NOT NULL
+ SUBTYPE_NAME	VARCHAR(100)	NOT NULL
+ CREATED_TIMESTAMP	DATETIME2(0)	NOT NULL
+ UPDATED_TIMESTAMP	DATETIME2 (0)	NOT NULL

PRIMARY KEY: SUBTYPE_ID

EVENT Table (Modified):

Rights: The CHART2_TRAFFIC_EVENT_ROLE role requires full C/R/U/D rights for this table.

This table is modified to add the optional INCIDENT_SUB_TYPE column.

EVENT Columns:

EVENT_ID	CHAR(32)	NOT NULL
LANE_CONFIG_ID	CHAR(32)	NULL
DB_CODE	VARCHAR(1)	NULL
EVENT_CODE	NUMERIC(3,0)	NOT NULL
EORS_TRACKING_NUMBER	VARCHAR(255)	NULL
CEN_CENTER_ID	CHAR(32)	NULL
CEN_ORIGINATING_CENTER_ID	CHAR(32)	NULL
PRIMARY_FLAG	NUMERIC(1,0)	NULL
LICENSE_PLATE_INFO	VARCHAR(52)	NULL
VEHICLE_INFO	VARCHAR(40)	NULL
OFFLINE_IND	NUMERIC(1,0)	NULL
EVENT_STATUS_CODE	NUMERIC(3,0)	NULL
SCENE_CLEARED_TIMESTAMP	DATETIME2(0)	NULL
DELAY_CLEARED_TIMESTAMP	DATETIME2(0)	NULL
CONFIRMED_TIMESTAMP	DATETIME2(0)	NULL
FALSE_ALARM_IND	NUMERIC(1,0)	NULL
EVENT_CLOSED_DATE	DATETIME2(0)	NULL
EVENT_OPEN_DATE	DATETIME2(0)	NULL
SOURCE_CODE	NUMERIC(3,0)	NOT NULL
HAZMAT_CODE	NUMERIC(1,0)	NULL
INCIDENT_CODE	NUMERIC(3,0)	NULL
+INCIDENT_SUB_TYPE	VARCHAR(100)	NULL
WEATHER_CLEANUP_INDICATOR	NUMERIC(1,0)	NULL

WEATHER_EVACUATION_INDICATOR	NUMERIC(1,0)	NULL
PAVEMENT_CONDITION_CODE	NUMERIC(3,0)	NULL
UPDATED_TIMESTAMP	DATETIME2(0)	NULL
OTHER_DESCRIPTION	VARCHAR(60)	NULL
DESCRIPTION	VARCHAR(512)	NULL
SOURCE_DESCRIPTION	VARCHAR(60)	NULL
LANE_STATE_DESCRIPTION	VARCHAR(1024)	NULL
EVENT_STILL_OPEN_REMINDER_TIME	DATETIME2(0)	NULL
PUBLIC_ALERT_CATEGORY	VARCHAR(50)	NULL
PUBLIC_ALERT_TEXT	VARCHAR(3000)	NULL
DESCRIPTION_OVERRIDDEN	NUMERIC(1,0)	NULL
AUX_DESCRIPTION	VARCHAR(512)	NULL
EVENT_INIT_USER_NAME	VARCHAR(40)	NULL
EVENT_INIT_CENTER_ID	CHAR(32)	NULL
EVENT_INIT_SCHEDULE_ID	CHAR(32)	NULL
EVENT_INIT_EXT_SYSTEM	VARCHAR(35)	NULL
EVENT_INIT_EXT_AGENCY	VARCHAR(35)	NULL
EVENT_INIT_EXT_EVENT	VARCHAR(35)	NULL
SCHEDULED_CLOSURE_TIME	DATETIME2(0)	NULL
EVENT_STILL_OPEN_REL_REM_TIME	NUMERIC(8,0)	NULL
PENDING_EVENT_CREATION_TIME	DATETIME2(0)	NULL
PENDING_EVENT_LAST_USED_TIME	DATETIME2(0)	NULL
EXTERNAL_EVENT_IND	NUMERIC(1,0)	NULL
EXTERNAL_INTERESTING_IND	NUMERIC(1,0)	NULL
PUBLIC_DESCRIPTION	VARCHAR(512)	NULL
OWNING_ORGANIZATION	CHAR(32)	NULL
PUBLIC_INCIDENT_CODE	NUMERIC(3,0)	NULL
PRIORITY_LIST_ORDER	NUMERIC(2,0)	NULL
EST_TIME_TO_CLEAR_MINS	NUMERIC(4,0)	NULL
OP_CENTER_POC	VARCHAR(80)	NULL
ON_SCENE_POC	VARCHAR(80)	NULL
COMMENTS	VARCHAR(1000)	NULL
GEO_SCOPE	NUMERIC(1,0)	NULL
WEATHER_INFO_JSON	VARCHAR(2048)	NULL
VIDEO_TOUR_RPI_ID	CHAR(32)	NULL
AUTO_AVL_DETECTION_ENABLED	NUMERIC(1,0)	NULL
PUBLIC_ALERT_TTS_TEXT	VARCHAR(3000)	NULL
PUBLIC_ALERT_DRAFT	NUMERIC(1,0)	NULL
PUBLIC_ALERT_TTS_DRAFT	NUMERIC(1,0)	NULL
LICENSE_PLATE_USPS_STATE_CODE	CHAR(2)	NULL
LICENSE_PLATE_STATE_FULL_NAME	VARCHAR(32)	NULL
LICENSE_PLATE_STATE_FIPS_CODE	CHAR(2)	NULL

PRIMARY KEY: EVENT_ID (Unchanged)

CODE_LIST_ITEM Table New Values:

CDL_CODE_TYPE_NAME	TYPE_CODE	ACTIVE_INDICATOR	TYPE_NAME
Action	113	1	INCIDENT SUBTYPE ADD
Action	114	1	INCIDENT SUBTYPE UPDATE
Action	115	1	INCIDENT SUBTYPE DELETE

2.4.1.2.2.4.5 Database Changes for the RV Vehicle Types**2.4.1.2.2.4.5.1 CHART ATMS DB**

The R16 RVs Vehicle Types feature adds values to the CODE_LIST_ITEM table for the new vehicle types used in ATMS.

CODE_LIST_ITEM Table New Values:

CDL_CODE_TYPE_NAME	TYPE_CODE	ACTIVE_INDICATOR	TYPE_NAME
Vehicles Involved	229	1	RV
Vehicles Involved	230	1	RV With Trailer

2.4.1.2.2.4.5.2 CHARTWeb DB

The R16 RVs Vehicle Types feature adds a column to the EVENT_VEHICLE_DATA table in CHARTWeb and updates to the following stored procedures.

EVENT_VEHICLE_DATA Table (Modified):

This table is modified to add columns for the RV Vehicle Types.

EVENT_VEHICLE_DATA Columns:

ID	INT	NOT NULL
eventid	VARCHAR(50)	NOT NULL
carsinvolved	INT	NOT NULL
carsoverturned	INT	NOT NULL
pickupsinvolved	INT	NOT NULL
pickupsoverturned	INT	NOT NULL
trucksinvolved	INT	NOT NULL
trucksoverturned	INT	NOT NULL
truckslostload	INT	NOT NULL
trailersinvolved	INT	NOT NULL
trailersoverturned	INT	NOT NULL
trailerslostload	INT	NOT NULL
trailersjackknifed	INT	NOT NULL
motorcyclesinvolved	INT	NOT NULL
carswithtrailerinvolved	INT	NULL

carswithtrailerlostload	INT	NULL
carswithtrailerjackknifed	INT	NULL
carswithtraileroverturned	INT	NULL
pickupswithtrailerinvolved	INT	NULL
pickupswithtraileroverturned	INT	NULL
pickupswithtrailerlostload	INT	NULL
pickupswithtrailerjackknifed	INT	NULL
vansinvolved	INT	NULL
vansoverturned	INT	NULL
vanswithtrailerinvolved	INT	NULL
vanswithtraileroverturned	INT	NULL
vanswithtrailerlostload	INT	NULL
vanswithtrailerjackknifed	INT	NULL
SUVsinvolved	INT	NULL
SUVsoverturned	INT	NULL
SUVswithtrailerinvolved	INT	NULL
SUVswithtraileroverturned	INT	NULL
SUVswithtrailerlostload	INT	NULL
SUVswithtrailerjackknifed	INT	NULL
truckswithtrailerinvolved	INT	NULL
truckswithtraileroverturned	INT	NULL
truckswithtrailerlostload	INT	NULL
truckswithtrailerjackknifed	INT	NULL
trailerscabonlyinvolved	INT	NULL
trailerscabonlyoverturned	INT	NULL
trailersdbltrailerinvolved	INT	NULL
trailersdbltraileroverturned	INT	NULL
trailersdbltrailerlostload	INT	NULL
trailersdbltrailerjackknifed	INT	NULL
loadedcommercialbusinvolved	INT	NULL
loadedcommercialbusoverturned	INT	NULL
unloadedcommercialbusinvolved	INT	NULL
unloadedcommercialbusoverturned	INT	NULL
loadedschoolbusinvolved	INT	NULL
loadedschoolbusoverturned	INT	NULL
unloadedschoolbusinvolved	INT	NULL
unloadedschoolbusoverturned	INT	NULL
cyclistsinvolved	INT	NULL
pedestriansinvolved	INT	NULL
+ RVsinvolved	INT	NULL
+ RVsoverturned	INT	NULL
+ RVswithtrailerinvolved	INT	NULL
+ RVswithtraileroverturned	INT	NULL
+ RVswithtrailerlostload	INT	NULL
+ RVswithtrailerjackknifed	INT	NULL

PRIMARY KEY: ID (Unchanged)

The following stored procedures are updated in R16 to support the vehicle count fields for the RV Vehicle Types.

Stored Procedures (Modified):

TRAFFIC_EVENT_ADD_INCIDENT

TRAFFIC_EVENT_ADD_INCIDENT_W_L

TRAFFIC_EVENT_SET_VEHICLE_DATA

2.4.1.2.2.4.6 Database Changes for PR ATMS-649 and PR ATMS-651

2.4.1.2.2.4.6.1 CHART ATMS DB

The changes for PR ATMS-649 removes the contact email address from the CONTACT table and creates a new table that can support multiple phone numbers. PR ATMS651 adds an optional extension to each phone number in the CONTACT_PHONE_NUMBER table:

CONTACT (Modify)

-EMAIL_ADDRESS

-ALLOW_NOTIFICATION

Remove CONTACT_NOTIFY_CHK constraint (ALLOW_NOTIFICATION flag is no longer in CONTACT table so constraint is no longer needed).

CONTACT_EMAIL (New)

+ CON_CONTACT_ID	CHAR(32)	NOT NULL
+ SORT_ORDER_NUMBER	TINYINT	NOT NULL
+ EMAIL_TYPE	TINYINT	NOT NULL
+ EMAIL_ADDRESS	VARCHAR(128)	NOT NULL
+ ALLOW_NOTIFICATION	BIT	NOT NULL
+ CREATED_TIMESTAMP	DATETIME2(0)	NOT NULL
+ UPDATED_TIMESTAMP	DATETIME2(0)	NOT NULL

Primary Key (CON_CONTACT_ID, SORT_ORDER_NUMBER)

Foreign Key (CON_CONTACT_ID REFERENCES CONTACT.CONTACT_ID)

Grant all rights to CHART2_NOTIFICATION_ROLE

CONTACT_PHONE_NUMBER (Modified)

+PHONE_EXTENSION	VARCHAR(6)	NULL
------------------	------------	------

EVENT_PARTICIPATION_CONTACT (Modified)

+PHONE_EXTENSION_LAST_USED	VARCHAR(6)	NULL
EVENT_PARTICIPATION_RESOURCE_OR_TYPE (Modified)		
+OPT_PHONE_EXTENSION_LAST_USED	VARCHAR(6)	NULL

2.4.1.2.2.5 Database Conversion

The ContactEmails\ContactEmail.sql script migrates two columns from the CONTACT table to the new CONTACT_EMAIL table then removes those columns from the CONTACT table.

2.4.1.2.2.6 PL/SQL Module Definition and Database Trigger Reports

There are no new PL/SQL modules for CHART ATMS R16.

2.4.1.2.2.7 Database Size Estimate - provides size estimate of current design

CHART ATMS R16 causes a small increase in the size of the CHART ATMS database as follows:

- CHART administrators are expected to add between 5 to 10 subtype definitions for each incident subtype with a maximum of 200 definitions total anticipated. Data required to store these definitions is insignificant. Based on 35,000 incidents in 2015, assuming all incidents get an incident subtype, and assuming an average of 15 characters to describe each subtype, this will add about 0.5MB of data per year to the archive database for assignment of incident subtypes. The RV vehicle type change will have virtually no effect, as other vehicle types involved will be correspondingly reduced.
- ATMS-655 adds a contact name associated with a participant to participation records in traffic event history entries. Based on 180,000 participation records logged in 2015, assuming every participation record has an associated contact name, and assuming an average of 20 characters per name, this would add, worst case, about 3.5MB of information to the archive database per year. This is a tiny fraction of the size of the overall Archive database, which consumes on the order of 75GB.
- ATMS-649 and ATMS-651 make minor additions to contacts and incident participation tables, however the net increase is insignificant.
- Date commissioned dates and export managed flags for about two thousand devices will cause negligible fixed increases in device table sizes. Likewise the new camera categories will increase each camera entry by an insignificant amount, amounting to perhaps 50 to 100KB in total, based on one to two categories for each of 1000 cameras.

2.4.1.2.2.8 Data Distribution

There are no changes to data distribution for R16.

2.4.1.2.2.9 Database Replication

Database replication is not used in R16.

2.4.1.2.2.10 Database Failover Strategy

The database failover strategy is defined as part of Work Order 27. There are no changes to the database failover strategy for R16.

2.4.1.2.2.11 Reports

No reports are added or updated for R16. Since R5, the CHART reporting function has been transferred to University of Maryland.

2.4.1.3 CHART Flat Files

The following describes the use of flat files in CHART ATMS.

2.4.1.3.1 Service Registration Files

There are no changes to service registration files for CHART ATMS R16.

2.4.1.3.2 Service Property Files

Service property files are organized the same for CHART ATMS R16 as previously. (There are no new property files, though various changes are necessary in some of the files.)

2.4.1.3.3 GUI Property Files

There are no changes to the GUI properties file in its WEB-INF directory for CHART ATMS R16.

2.4.1.3.4 Device Logs

There are no changes to Device Log Files for CHART ATMS R16.

2.4.1.3.5 Service Process Logs

All CHART ATMS services write to a process log, used to provide a historical record of activity undertaken by the services. These logs are occasionally referenced by software engineering personnel to diagnose a problem or reconstruct a sequence of events leading to a particular anomalous situation. These logs are automatically deleted by the system after a set period of time defined by the service's properties file, so they do not accumulate infinitely. These files are stored in the individual service directories and are named by the service name and date, plus a ".txt" extension. These logs are typically read only by software engineering personnel. There are no changes to the organization of service process log files for CHART ATMS R16.

2.4.1.3.6 Service Error Logs

All CHART ATMS services write to an error log, used to provide detail on certain errors encountered by the services. Most messages, including most errors, are captured by the CHART ATMS software and written to the process logs, but certain messages (typically produced by the Java Virtual Machine itself, by COTS, or DLLs) cannot be captured by CHART ATMS Software and instead are captured in these "catch-all" logs. Errors stored in these logs are typically problems resulting from a bad installation; once the system is up and running, errors rarely appear in these error logs. Debugging information from the JacORB COTS, which is not usually indicative of errors, can routinely be found in these error logs, as well. These log files can be

reviewed by software engineering personnel to diagnose an installation problem or other type of problem. These logs are automatically deleted by the system after a set period of time defined by the service's properties file, so they do not accumulate infinitely. These files are stored in the individual service directories and are named by the service name and date, plus an ".err" extension. These logs are typically read only by software engineering personnel. There are no changes for service error logs for R16 features.

2.4.1.3.7 GUI Process Logs

Like the CHART background services, the CHART ATMS GUI service also writes to a process log file, used to provide a historical record of activity undertaken by the process. These GUI process logs are occasionally referenced by software engineering personnel to diagnose a problem or reconstruct a sequence of events leading to a particular anomalous situation. These logs are automatically deleted by the system after a set period of time defined by the GUI service's properties file, so they do not accumulate infinitely. These files are stored in the `chartlite/LogFiles/` directory under the `WebApps/` directory in the Apache Tomcat installation area. They are named by the service name ("chartlite") and date, plus a ".txt" extension. These logs are typically read only by software engineering personnel. Additional log files written by the Apache Tomcat system itself are stored in the `log/` directory in the Apache Tomcat installation area.

- The CHART ATMS R16 GUI changes do not change the way the GUI process logs operate.

2.4.1.3.8 FMS Port Configuration Files

The CHART ATMS Communications Services read a Port Configuration file, typically named `PortConfig.xml`, upon startup, which indicates which ports are to be used by the service and how they are to be initialized. A Port Configuration Utility is provided which allows for addition, removal of ports and editing of initialization parameters. As indicated by the extension, these files are in XML format. This means these files are hand-editable, although the Port Configuration Utility allows for safer, more controlled editing. The Port Configuration files are typically modified only by software engineers or telecommunications engineers.

- There are no changes to this section for the any of the CHART ATMS R16 features.

2.4.1.3.9 Watchdog Configuration Files

The Watchdog service uses XML configuration files to specify what actions to take for each ATMS service. There are no changes to the Watchdog configuration files for CHART ATMS R16.

2.4.1.4 Database Design

Changes made to the CHART ATMS database design for Release 16 features are described below.

2.4.1.5 CHART ATMS DB

2.4.1.5.1 Device Commissioned Date Feature

The R16 Device Commissioned Date feature adds a column to the DMS, HAR, SHAZAM, TSS, CAMERA, MONITOR, and ON_OFF_DEVICE tables. See the details described in section 2.4.1.2.2.4.1.1 above.

2.4.1.5.2 CCTV Export Enhancement Feature

The R16 CCTV Export Enhancements feature adds a new column to the CAMERA table, a new column to the STREAMING_SERVER_CONFIG table and a new table to store optional camera categories for cameras. See the details described in section 2.4.1.2.2.4.1.1 above.

2.4.1.5.3 PR ATMS-868

The changes for PR ATMS-868 add one new column to the DMS, HAR, SHAZAM, and TSS tables. See the details as described in 2.4.1.2.2.4.3 above.

2.4.1.5.4 Incident Sub-Types Feature

The R16 Incident Sub-Types feature adds a new column to the EVENT table and a new table INCIDENT_SUBTYPES. See the details described in section 2.4.1.2.2.4.4.1 above.

2.4.1.5.5 RV Vehicle Types Feature

The R16 RV Vehicle Types feature adds data to the CODE_LIST_ITEM table and changes to a CHARTWeb table and stored procedures. See the details described in section 2.4.1.2.2.4.5 above.

2.4.1.5.6 PR ATMS-649 and 651

The changes for PR ATMS-649 and 651 add a new column to the CONTACT_PHONE_NUMBER, EVENT_PARTICIPATION_CONTACT, and EVENT_PARTICIPATION_RESOURCE_OR_TYPE tables, remove two columns from the CONTACT table, and add a new CONTACT_EMAIL table. See the details as described in 2.4.1.2.2.4.6 above.

2.4.1.6 Archiving - Changes

The CHART ATMS Archive database stores data from the CHART operational system as part of a permanent archive. The CHART ATMS Archive database design is a roughly copy of the CHART ATMS operational system for those tables containing system, alert, traveler information messages and their underlying data, traffic event data, and log information. In addition, the CHART ATMS Archive database stores detector data. There are no changes to the way data is archived or the types of data archived for CHART ATMS R16, although there are subtle changes in the specific data archived, in accordance with changes described for the live database.

2.4.2 Mapping

CHART Mapping Release 17 is tested and delivered with the fielded MS SQL Server version.

2.4.2.1 Data Storage

The CHART Mapping stores most of its data in a non-spatial MS SQL Server database. Additionally location aliases are stored in a spatial SQL Server database. Some data is stored in flat files on the CHART servers.

This section describes all of these types of data.

2.4.2.2 Database

2.4.2.2.1 Database Architecture

Except as noted, CHART Mapping Release 17 features do not impact the overall architecture of the CHART applications.

2.4.2.2.2 Logical Design

2.4.2.2.2.1 CHART Live Database Entity Relationship Diagram (ERD)

The CHART Mapping (CHARTWeb) Database entity relationship diagram for R17 is shown below in the figures that follow, in Figure x-x through Figure x-x. The Table Definition Report sections that follow describe the changes that are made for R17.

2.4.2.2.2.2 Function to Entity Matrix Report

The Create, Retrieve, Update, Delete (CRUD) matrix cross-references business functions to entities and shows the use of the entities by those functions. This report is generated as part of the CHART O&M Guide.

2.4.2.2.2.3 Table Definition Report –

In tables shown below:

- Deleted columns/constraints marked with a minus sign (“-”)
- Modified columns/constraints marked with an asterisk (“*”)
- New columns/constraints marked with a plus sign (“+”)

2.4.2.2.2.3.1 Database Changes for the Lufft Weather Data

2.4.2.2.2.3.1.1 CHART Web DB

The Mapping R17 Lufft enhancement feature changes the following tables:

CHARTImportedWeatherData (Added)

Rwis_atmos_yesterday Table (Removed)

Rwis_surface_yesterday Table (Removed)

RWIS_Sensor_Route_lkp_0117 Table (Removed)

RWIS_Status_lkp Table (Removed)

RWIS_Status_lkp_Luft_bak Table (Removed)

Rwis_surface_yesterday Table (Removed)

RWISData_LUFT Table (Removed)

Temp_G_RWIS Table (Removed)

2.4.2.2.2.4 Database Conversion

There are no database conversion scripts identified for CHART Mapping R17.

2.4.2.2.2.5 PL/SQL Module Definition and Database Trigger Reports

The Mapping R17 Lufft enhancement feature makes the following changes:

Cw_RWISData_LUFT (Removed)

Event_get_all_traffic_weather_incidents (Removed)

Event_get_weather_closure_events (Removed)

Event_get_weather_closure_high_water_events (Removed)
Event_get_weather_closure_winter_precip_events (Removed)
Event_Get_Weather_Lane_Closures (Removed)
Event_get_weather_events (Removed)
Event_get_weather_incidents (Removed)
getSourceConfig (Modified)
getSourceData (Modified)
GV_EORSCLOSUREPT_WEATHER (Removed)
GV_RWIS (Modified)
GV_RWISInter (Removed)
Mobile_RWIS_Roads (Removed)
Mobile_Weather_Station_Data_By_ID (Removed)
Mobile_Weather_Station_Data (Removed)
Populate_rwis_history (Removed)
PR_Lufft_GetRoadwaySensor (Modified)
PR_Lufft_GetStation (Modified)
Traffic_event_add_weather_event (Removed)
Traffic_event_update_Weather_conditions (Removed)
Vw_eors_gv_rwis (Removed)
Vw_rwisDataLuft (Removed)
Vw_RWISDateTime (Removed)
Vw_RWISDateTime_Luft (Removed)
Vw_RWISInter (Removed)
Wap_weather_closures (Removed)
Wap_weather_lane_closures (Removed)
Xml_RWIS (Removed)

2.4.2.2.2.6 Database Size Estimate - provides size estimate of current design

CHART Mapping R17 does not cause an increase in the size of the CHARTWeb database.

2.4.2.2.2.7 Data Distribution

There are no changes to data distribution for Mapping R17.

2.4.2.2.2.8 Database Replication

Database replication is not used in Mapping R17.

2.4.2.2.2.9 Database Failover Strategy

There are no changes to the database failover strategy for Mapping R17.

2.4.2.2.10 Reports

No reports are added or updated for Mapping R17.

2.4.2.3 CHART Mapping - Lufft Weather Data (WO 54)

The following is an outline of the changes that will be made to acquire Lufft Weather data for all CHART applications.

1. Remove the current chart_weather_data view in MySQL database.
The task also includes removing the entire 'chartdb' database in the MySQL database. This was added by the CHART team to acquire Lufft data. A new table in CHARTWeb database will be added (for e.g. ChartImportedWeatherData) that stores the imported weather sensor data.

The table below lists the information that the chart_weather_data view is currently providing. Recommendations to keep/remove the attribute in the new table are based upon the needs of the CHART applications. The comments includes any translation rules that will need to be put together to acquire the same attribute from the imported SmartView csv files.

Attribute	Recommendation	Comments
stations. station_id	Keep	Acquired from csv file name of the format: CHARTEExport_<station_id>.csv For e.g. CHARTEExport_1.csv, CHARTEExport_24.csv The station_id is the assigned SmartView identifier which corresponds to rpu_number in the CHARTWeb database.
stations. collector_id	Keep	Assume 1 * CHART applications assume the system number for Lufft is the same as collector id. There could potentially be multiple collectors in SmartView but we can ignore that, as it represents the source of the weather station data in CHART. Change it to assume as system number of 1 as used in CHART for Lufft.
stations. station_name	Remove	This can be retrieved from the G_RWIS table.
stations. station_type	Remove	Not needed as current CHART applications have no need for the model of the Lufft weather station
station_sensors. sensor_nr	Keep	The header name in the SmartView imported .csv file will be of the format: <sensorNr>#<sensorName> The translation rules for the column header will include parsing the text to get the sensor number and sensor name. For e.g. 1#Air Temperature, where sensor number =1 and sensor name = air temperature.
station_sensors. sensortype	Remove	Integer value of the sensor type which is not needed and not used.
station_sensors. sensor_name	Keep	The header name in the SmartView imported .csv file will be of the format: <sensorNr>#<sensorName> The translation rules for the column header will include parsing the text to get the sensor number and sensor name. For e.g. 1#Air Temperature, where sensor number =1 and sensor name = air temperature.
sensors. unit_id	Remove	Integer value of the unit type which is not needed and not used
units. unit_name	Remove	Unit name not needed and not used.

Attribute	Recommendation	Comments
units. unit	Remove	Unit not needed. If it is required then we will need to tag the column header with it. Units of each type of imported sensor will be assumed based on the table that follows later. <i>*The main objective here is to only tag the needed text in the column headers and not to overwhelm it.</i>
last_sensor_values. value_type	Remove	Average or actual. If it is required then we will need to tag the column header with it. Value type of each imported sensor will be assumed based on the table that follows later. <i>*The main objective here is to only tag the needed text in the column headers and not to overwhelm it.</i>
last_sensor_values. poll_time	Keep	First column in the csv file.
last_sensor_values. value	Keep	Data for the weather sensor in the .csv file. The value will either be a number or a text based on the status format. <i>For e.g. "65.3" for road surface temperature in Fahrenheit; or "dry" for road condition. It will be stored as string in CHARTWeb database and will need to be appropriately formatted in CHART applications.</i>
sensor_type_template.se nsor_type_name	Remove	Not needed as this represents the logical sensor type name.
stations.location	Remove	This can be retrieved from the G_RWIS table.
stations. tz_name	Remove	Not needed as it is always "Eastern Standard Time"
last_sensor_values. value OR status_map_entry. description	Remove	Not needed. The value above will either be a number or a text based on the status format.
sensors. sensor_type_name2	Remove	Not needed as this represents the logical sensor type name based on the web site display.
station_sensors. channel	Remove	Not needed and not used.
status_map_entry. status_map_id	Remove	Integer value of the status map entry assigned to the display on the web site. Not needed and not used.

2. Add a CHART specific export job in SmartView

An export job based on CHART needs will be added in SmartView. The information written by the export job will be based on the following sensor types:

Sensor	Value Type	Assigned Mapped Status (to convert value to string in SmartView)	Unit	Used by CHART application
Air Temperature	act		°F	<ul style="list-style-type: none"> Chart on the Web Weather Service Intranet Map EORS Export Client
Dew Point	act		°F	<ul style="list-style-type: none"> Chart on the Web Intranet Map Export Client
Precipitation Type	act	R2S Precipitation Type (ch700)		<ul style="list-style-type: none"> Chart on the Web Intranet Map

Sensor	Value Type	Assigned Mapped Status (to convert value to string in SmartView)	Unit	Used by CHART application
				<ul style="list-style-type: none"> Weather Service Export Client
Relative Humidity	act		%	<ul style="list-style-type: none"> Chart on the Web Intranet Map Export Client
Road Condition	act	IRS31 Road Condition (ch902) Road Condition IRS31 Pro		<ul style="list-style-type: none"> Weather Service Intranet Map Trigger Module
Road Surface Temp	act		°F	<ul style="list-style-type: none"> Chart on the Web Weather Service EORS Export Client
Visibility	act		miles	<ul style="list-style-type: none"> Chart on the Web Intranet Map Weather Service Trigger Module
Water Film Height	act		mil	<ul style="list-style-type: none"> Intranet Map
Wind Direction	act	Wind Direction	°	<ul style="list-style-type: none"> Chart on the Web Intranet Map Weather Service Export Client
Wind Gust	act		mph	<ul style="list-style-type: none"> Intranet Map Export Client
Wind Speed	avg		mph	<ul style="list-style-type: none"> Chart on the Web Intranet Map Weather Service Trigger Module Export Client

The export job will be added via an “insert script” that automatically inserts a record for the CHART Export Job in MySQL database of SmartView. This is being done to avoid manual entry of defining the weather station (xxx) jobs and to reduce errors. The SQL Import job will rely on the tagged information and any errors will cause disruption in importing weather sensor data.

The script will include the following

1. Define the main CHART Export Template Job
2. Using the CHART Export Template add a job record for each weather station based upon the attached weather sensors.

Record(s) will be inserted in the following SmartView tables that hold information for the exported jobs.

1. Table **“export_job”** : This table holds information about export jobs

Column	Type	CHART Export Template Values	Description
job_id	int	MAX(JOB_ID)+1	Id of job

Column	Type	CHART Export Template Values	Description
job_name	blob	CHAR Export Template	Name of job (Unicode, stored as hex string)
job_type	int	1	(internal enum) type of job (Export / Import or both)
run_type	int	7	(internal enum) job is run manual/on new data or on different time intervals
run_every	int	5	Counter for run_type interval
run_hour	int	0	Time of day job is run
run_day	int	1	Day of week or month job is run
export_format	int	1	(internal enum) format for export (CSV,XML,...)
data_start	int	17	(internal enum) specifies time for start of data (all available, fixed, or start of a specific interval like last week or last month...)
data_iv_counter	int	1	Number of data_intervals
data_iv	int	11	(internal enum) interval for data (all data, fixed end time, or interval like hour, week, month, year)
export_filename	varchar(255)	C:\inetpub\wwwroot\CHARTExport\CHARTExport#<station_id>.csv	Name of export file, may contain tags <date> or <timestamp>
export_decimal_point	char(1)	.	Character to be used as decimal point ("," or ".")
export_error_value	varchar(255)	error	String to indicate an error value
export_csv_separator	varchar(255)	,	Character/String to be used as csv separator ("," or ";" or TAB)
export_values_in_quotes	int	0	(bool) flag if csv export values are quoted or not
export_include_header	int	1	(bool) flag if header line should be written
export_append_data	int	0	(bool) flag if data is appended to export file, or if export file is overwritten
export_time_is_local	int	4	(bool) flag if timestamps are in local time or in UTC time
export_time_sep_column	int	0	(bool) flag if date and time are to be written in separate columns
export_date_str	varchar(255)	yyyy/mm/dd	Format string for date (yyyy = year, mm = month, dd=day, default yyyy/mm/dd)
export_time_str	varchar(255)	hh:mm:ss	Format string for time (hh = hour, mm= minute, ss=second, default hh:mm:ss)
export_last_column_with_sep	int	0	(bool) flag if last column is terminated by csv separator or not
last_run	int unsigned	0	Timestamp (UTC) of last run of job
next_run	int unsigned		Timestamp (UTC) of next run of

Column	Type	CHART Export Template Values	Description
			job
import_f_ilename	varchar(255)		Name of import file, may contain tags <date> or <timestamp>
import_format	int	1	(internal enum) Format of import file (currently only CSV is supported)
import_skip_header	int	0	(bool) skip first line of import file (because it is a header line)
import_decimal_point	char(1)	.	Character used as decimal point ("." or ",")
import_error_value	varchar(255)		String that indicates an error value
import_error_column	int	0	Not used (column that indicates error value)
import_no_val_is_error	int	0	(bool) if true, a missing value is treaded as an error value
import_csv_separartor	varchar(255)	,	Character/string used as separator in CSV file ("," or ";" or TAB)
import_values_in_quotes	int	0	(bool) flag that indicates if values are quoted
import_time_is_local	int	4	(bool) flag that indicates if time values are in local time or in UTC
import_time_in_sep_column	int	0	(bool) flag that indicates if date and time are in separate columns or not
import_date_str	varchar(255)	yyyy/mm/dd	Format string for date (yyyy = year, mm = month, dd=day, default yyyy/mm/dd)
import_time_str	varchar(255)	hh:mm:ss	Format string for time (hh = hour, mm= minute, ss=second, default hh:mm:ss)
exe_filename	varchar(255)		Name of (external) program to be run
exe_params	varchar(255)	#export_file #import_file	Params for (external) program. May contain tags #export_file and #import_file (which are replaced by the appropriate values)
run_error	int	0	Exit code of (external) program
use_ftp	Int	0	(bool) flag that indicates if ftp should be used to a) transfer the export file for jobs of type EXPORT or of type EXPORT AND IMPORT after the export file has been written b) transfer the import file for jobs of type IMPORT before the import file is processed
ftp_host	varchar(255)		Name or IP of ftp host
ftp_port	int	21	Port number to be used for ftp (default : 21)

Column	Type	CHART Export Template Values	Description
remote_filename	varchar(255)		Name of remote file
ftp_user	varchar(255)		User name for ftp
ftp_password	varchar(255)		Password for ftp user
ftp_binary	int	1	(bool) use ftp binary transfer
ftp_passive	int	1	(bool) use ftp passive mode
station_id	int	0	Station associated with this job
fixed_data_start	int unsigned	0	Timestamp (UTC) for data in export job if a fixed date is assigned
fixed_data_end	int unsigned	4294865648	Timestamp (UTC) for data in export job if a fixed date is assigned
export_date_header	blob	date	Header for date column in export file (Unicode stored as hex string)
export_time_header	blob	time	Header for time column in export file (Unicode stored as hex string)
is_active	int unsigned	1	(bool) export job is active
Import_only_new_files	Int unsigned	0	(bool) only import files that have been "last modified" after job was run last time
ftp_delete_source	Int unsigned	0	(bool) delete source file after ftp transfer
Import_delete_after	Int unsigned	0	(bool) delete import file after import was successful
export_no_values	Int unsigned	1	(bool) create export file (empty or with header only) even if there is no data to export
is_template	int unsigned	1	(bool) indicates that job is a template job
job_template_id	int unsigned	23	ID for Export Job Template
template_type_id	int unsigned	0	ID for pre-defined export job template

Column	Type	CHART Export Template Values	Description
import_delete_old_data	int unsigned	0	(bool) delete all (old) data for import sensors before writing new data to database (for prognosis/forecast)
thread_id	int unsigned	0	Internal id for thread
run_in_collector	int unsigned	0	(bool) run export job from collector instead of smartcom
export_add_utc_timestamp	int unsigned	0	(bool) add an additional UTC timestamp in first column of CSV Export

2. Table “export_sensors” : This table holds information about sensors in a specific export job (of type EXPORT or EXPORT AND IMPORT)

Column	Type	Description
job_id	int	Id of job
station_id	int	Station id to identify sensor
sensor_nr	int	Sensor nr to identify sensor
value_type	int	(internal enum) value type to identify sensor
convert_type	int	(internal enum) specifies the conversion that is to be done on value when exported (none, to int, or to bool)
sequence	int	Sequence of sensor in export
last_export	int unsigned	Timestamp (UTC) of last exported value for this sensor
compare_operator	int	(internal enum) compare operation to be performed when value is converted to bool (<, <=, ==, >=, >, !=)
compare_value	float	Value for comparison when value is converted to bool
export_name	blob	Name of Column (Unicode) for header in export file
export_scale	float	Scale factor for export
value_map_id	Int unsigned	Id of value map used when data is exported
sensor_template_id	int unsigned	Sensor Type Template ID (log. Sensor Type) for this sensor
unit_name	blob	Expected unit name for template job sensor (UNICODE)
export_id1	int unsigned	Export type specific id 1 for sensor (e.g. FG for TLS type export)
export_id2	int unsigned	Export type specific id 2 for sensor (e.g. DE channel for TLS type export)
export_id3	int unsigned	Export type specific id 3 for sensor (e.g. DE type for TLS type export)
status_map_id	Int	ID for status map (export output will be text from status mapping)

3. Consolidate database entities in CHARTWeb database

This task will comprise of changing or removing of weather related entities in the CHARTWeb database. As outlined below:

- a. Removal of linked server connection to MySQL database. The following database entities will need to be changed to remove the dependencies.

Entity	Type	Dependencies	Applications	Comments
cw_RWISData_LUFT	SP	Populates RWISData_LUFT	SQL Job	RepRWISData_luft SQL Job ** REMOVE ** Provide a new stored procedure for importing csv files.
event_get_all_traffic_weather_incidents	SP		None	**REMOVE** Not being used. <i>Source: Data Dictionary</i>
event_get_weather_closure_events	SP		None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
event_get_weather_closure_high_water_events	SP		None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
event_get_weather_closure_winter_precip_events	SP		None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
EVENT_Get_Weather_Lane_Closures	SP		None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
event_get_weather_events	SP		None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
event_get_weather_incidents	SP		None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
G_RWIS	T	CHARTDeviceEditor.mxd, PR_Lufft_GetRoadwaySensor, PR_Lufft_GetStation, RWIS_GetRoadwaySensor, RWIS_GetStation	Intranet Map, ATMS Weather Service, ATMS Trigger Service, CHART on the Web	Stores spatial information for RWIS'. ** No Changes **
getSourceConfig	SP		ATMS Weather Service	** Changes required ** use of view that provides access to imported Lufft data.
getSourceData	SP		ATMS Weather Service	** Changes required ** use of view that provides access to imported Lufft data.
GetRdCondString	F	PR_Lufft_GetRoadwaySensor, getSourceConfig, getSourceData	ATMS Weather Service, ATMS Trigger Service	Gets the string that represents Roadway conditions for a Lufft sensor. ** No Changes **
GV_EORSCLOSUREPT_WEATHER	V	CHARTWeb..vw_EORSCLOSUREPT_WEATHER_basicinfo	None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>

Entity	Type	Dependencies	Applications	Comments
GV_RWIS	V	CHARTWEB_JS 2.mxd, CHART_Non_Public_KMZ.mxd, CHART_Public_Mobile.mxd, CHART_Public_PC.mxd, iMap.mxd, iMap_Non_public.mxd, NET Map, CHARTWeb_No Map	Intranet Map, External REST Services	** Changes Required ** consolidate with VW_RWISData_Group
GV_RWISINTER	V	CHARTWeb_No Map	CHART on the Web	Spatial view for list of RWIS'. ** REMOVE ** Use GV_RWIS instead
Mobile_RWIS_Roads	F	CHARTWebMobile, Mobile_Get_Active_Roads	CHART Web Mobile	** REMOVE ** Not being used, as CHART Web Mobile has been taken offline.
Mobile_Weather_Station_Data_By_ID	SP		None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
Mobile_Weather_Station_Data	SP		None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
Populate_rwis_history	SP		Chart on the Web	CWEB-299
PR_Lufft_GetRoadwaySensor	SP	Weather Service	ATMS Weather Service	Gets the list of roadway sensors associated with Lufft weather stations. ** Changes required ** use of view that provides access to imported Lufft data.
PR_Lufft_GetStation	SP	Weather Service	ATMS Weather Service	Gets the list of Lufft weather stations. ** Changes required ** use of view that provides access to imported Lufft data.
rwis_atmos_yesterday	T	populate_rwis_history	None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
Rwis_surface_yesterday	T		Chart on the Web	CWEB-299
RWIS_Sensor	T		ATMS Weather Service	Trigger Module ** No Changes **
RWIS_Sensor_Route_Link	T	PR_Lufft_GetRoadwaySensor, RWIS_GetRoadwaySensor	ATMS Weather Service	Lookup for RWIS sensors. ** No Changes **

Entity	Type	Dependencies	Applications	Comments
RWIS_Sensor_Route_lkp_0117	T		None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
RWIS_Status_lkp	T	RWIS_GetRoadwaySensor	None	Lookup for RWIS SCAN sensor status. ** REMOVE ** <i>Stored procedure no longer exists.</i>
RWIS_Status_lkp_LUFT	T	cw_RWISData_Luft, vw_RWISData_Group		Lookup for RWIS Luft sensor status. ** No Changes **
RWIS_Status_lkp_LUFT_bak	T		None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
rwis_surface_yesterday	T	populate_rwis_hist	None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
RWISData_LUFT	T	cw_RWISData_Luft, vw_RWISData_Group	Export Client	Stores Luft RWIS data. ** REMOVE ** <i>replace it with the new table that stores imported Luft Weather Sensor data.</i>
temp_G_RWIS	T		None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
traffic_event_add_weather_event	SP		None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
traffic_event_update_weather_conditions	SP		None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>
vw_eors_gv_rwis	V		EORS	** REMOVE ** <i>replace it with the use of GV_RWIS</i>
VW_RWISData_Group	V	vw_RWISDateTimeLuft, vw_RWISInter	CHART on the Web	Retrieves the RWIS data groups information ** REMOVE **
VW_RWISDataLuft	V	cw_RWISData_Luft	CHART on the Web	Retrieves Luft data. ** REMOVE **
vw_RWISDateTime	V	GV_RWIS	CHART on the Web	Retrieves RWIS date time. ** REMOVE **
vw_RWISDateTime_Luft	V	GV_RWIS		Retrieves Luft date time. ** REMOVE ** <i>requires changes to GV_RWIS</i>
vw_RWISInter	V	GV_RWISInter	CHART on the Web	Retrieves RWIS data for the Internet. ** REMOVE ** <i>replace it with the use of GV_RWIS</i>
wap_weather_closures	SP		Chart Web Mobile	** REMOVE ** Not being used.

Entity	Type	Dependencies	Applications	Comments
wap_weather_lane_closures	SP		Chart Web Mobile	** REMOVE ** Not being used.
XML_Get_RWIS	SP	CHARTWeb_No Map	CHART on the Web	Gets the list of RWIS in XML format.
xml_rwis	SP		None	** REMOVE ** Not being used. <i>Source: Data Dictionary</i>

3 Key Design Concepts

3.1 List of Call Lists Enhancement

This enhancement changes each contact listed in each call list to be a link that when clicked, shows the details for the contact. This feature already exists for contacts shown on the traffic event details page in the participants section. The intent was to copy that existing code directly to the call list page, however it was discovered that the existing code loads the information for all contacts in the participants section at the time the page is loaded. This is not an issue for the traffic event details page, as the number of contact participants for an event is a relatively small number. This approach is not scalable for the call lists page, however, as there are currently over 360 contacts listed on that page and that number could grow. For this reason, we designed the call list page to retrieve contact information on-demand when the user clicks the link to view contact details. This could lead to a "Please wait..." message being shown for a short period of time while the request is processed, however in most cases the results should be immediate without any noticeable delay. This approach minimizes the initial page load time even as more call lists are added to the system.

3.2 Date Commissioned Field

There are no significant design decisions for the addition of a Date Commissioned field for devices. This field will be added within the current GUI and Server frameworks. Note that this new field will not be exported; it is for internal use only.

3.3 Task 104 PRs

3.3.1 ATMS-536: E-mail address validation

There are no significant design decisions related to this issue. The existing e-mail validation will be enhanced to detect addresses with two consecutive periods, those that start with a period or @ character, and those that contain more than one @ character. Furthermore, a bug that prevents the system from properly showing each recipient's notification status when one or more invalid e-mail addresses exist will be corrected.

3.3.2 ATMS-638: User right incorrect for assigning AOR to monitor

There is no significant design decisions associated with this issue. The GUI code is using the wrong user right to determine if the user should be shown the links used to edit or disassociate AORs that are associated with a monitor for the purpose of auto-mode.

3.3.3 ATMS-655: Enhance log messages for event participants

Event history and operations log messages did not previously include any information about contacts that are associated with those operations. For example, when a contact is added to the traffic event as a stand-alone participant, the log message did not identify the contact that was added. Furthermore, if a contact is added to a participant from a call out list, the log message did

not identify the contact that was added. Any operations performed on the contact did not identify the contact either. The reason the log messages were lacking this information is because the traffic event service only has access to the ID of the contact and no other contact related information.

To enhance these log messages, the traffic event service will have to gain access to the contact data. One solution would have been for the traffic event service to cache information about each contact in the system, however that involves a lot of work to initialize the cache and keep it up to date, additional CORBA events, and the use of additional memory and resources. Instead, it was decided we would call the ContactManager each time we need a contact's name for a log message. It is possible, however, that the notification service where the ContactManager is hosted could be down or unresponsive. For this reason the code will make use of a utility class that can execute an action asynchronously but allow the caller to synchronously wait for the action to complete, with a time limit. This time limit will be fully configurable in the traffic event service properties file.

In the event the notification service is not available or the call to retrieve the contact data fails for any other reason, the operation will proceed and the log messages will revert back to their pre-R16 format without information about the contact. Worst case, this will occur after the time limit as specified in the traffic event properties file, thereby slowing operations that involve participants with a contact or a stand-alone contact participant. It is anticipated the notification service should rarely be unavailable when the traffic event service is running, and therefore this scenario is not expected to occur frequently (if at all).

3.3.4 ATMS-868: Add managed export flag for DMS, HAR, SHAZAM, and TSS

There are no significant design changes for this PR; the new flag will be added within the current GUI and server frameworks.

Mapping REST Services will use the new flag when providing data via the external REST services. It will filter out devices in the feed based on the 'managed export' flag (except for IMap rest services).

3.3.5 ATMS-571: County Mileposts

In R16 and prior, the county milepost data is not returned to the GUI from the GIS Mapping Service query to get intersecting features, even when "&feature=all" is specified in the request. A new request is being made in R16 to get the county mileposts. This request makes use of the existing GUI design which executes the requests for intersecting features simultaneously (in parallel), and waits for all of them to finish. This should be quicker than issuing another request sequentially, and may even be quicker than changing the GIS Mapping Service to return the county mileposts in the same request. Sending a separate request for the county mileposts also ensures that the volume of data returned does not become as large as a single combined request would return. It also keeps the risk of timing out lower than making a single combined request, which would have taken longer due to the additional lookup.

3.3.6 ATMS-597: Change Direction of South/North to North/South

The code that provides a text description for the direction defined in the IDL as SOUTH_NORTH is being changed to “North/South”. The IDL and XSD constants used to represent this direction will not be changed to avoid any possible effect on downstream systems. The lane editor will also remain unchanged and the southbound direction will continue to be shown on the left of the lane image and northbound will continue to be shown on the right.

3.3.7 ATMS-649 AND ATMS-651: support a contact’s phone extension and multiple contact email addresses

There are no significant design changes for these PRs; a contact can now include an optional phone extension and multiple email addresses (where previously at most one was allowed).

3.4 CHART External Interface Updates

- **CHART CCTV Export:** There are no significant design decisions to support the 3 new fields (Camera managed export indicator, camera categories, and Streaming Server Zones) in the GUI and Server frameworks. The Data Exporter will control the export of “managed export” cameras by requiring External Clients to have the Export Managed Camera functional right. The Data Exporter will also control the export of streaming server information for cameras by requiring External Clients to have the functional rights for the specific streaming server zone (Public, Internal, SWGI and MVIEW). All of the new fields will be exported to downstream systems.
- **CHARTWeb CCTV Updates –**
 - **Change data source and configuration for Traffic Camera popups:** Now CHARTWeb video player won’t be creating links with data directly with the chart database and will now be creating links by linking to the CCTV Export interface for camera information.
 - **Traffic Cameras page will now be generated based on CCTV Export:** The current page generates itself based on a text file. We’re now going to use the CCTV Export to determine what links are being displayed.
 - **Traffic Cameras RSS/XML Feed will be generated based on CCTV Export:** Now RSS feed will be created using CCTV Export instead of linking directly with the database
- **Intranet Map CCTV Updates**
 - Use the video feed for a camera associated with the ‘Internal’ zone.
 - Deprecate the use of “isDisplayedOnIntranetMap” and ‘isDisplayedOnPublicMap’ from all views.
- **Mapping REST Services CCTV Updates**
 - Update the external rest services (except IMap) to filter out cameras that are marked as ‘managedExport’, and provide the video feed URL for the ‘Public’ zone.
- **WO54, Lufft Interface:**

- Import weather sensor data from .csv exported files by SmartView
- Translate the data based on pre-defined conversion rules.
- Save the imported and translated data to the CHARTWeb database
- Improve and consolidate database entities related to weather sensor data in the CHART Web database.

3.5 Incident Sub-Types

The design for the Incident Sub-Types feature is fairly straightforward. The Edit Incident Information Form is updated to allow an optional pre-defined sub-type to be assigned to an incident event. Upon changing the incident type within the form, the list of pre-defined sub-types is updated to reflect only those sub-types applicable to the parent incident type currently selected. The sub-type once selected is viewable on the Incident Details section on the Event Details Page, as well as appended to the event name following the incident type. The updated event name including the incident sub-type is viewable by users with the View Sensitive Traffic Event Information and View Traffic Event Details rights. Sub-type text within an event name is also searchable through the Home Page Search field when the Traffic Event search option is selected.

The pre-defined incident sub-type definitions will be stored and managed through the system profile for users with the Configure Systems right. The sub-type definition will be assigned a unique id and a 100 character distinct sub-type name respective to the parent incident type. The user will be allowed to enter zero or more incident sub-types for each of the current 17 defined incident types.

3.6 RV Vehicle Types

The design for the RV Vehicle Types feature is fairly straightforward. The Vehicle Types for RV and RV with Trailer are added to the list of applicable vehicle types on the Edit Incident Information Form for an incident event. Vehicle counts for either of these types will affect the Trucks TMDD Vehicle Count, and the overall vehicle counts total. The counts for RV Vehicle Types are also added to the VehicleGroupAffected type of an incident event which is exported to external systems such as CHARTWeb, Intranet Map, and the Public CHART on The Web site.

3.7 Packaging

3.7.1 CHART ATMS

This software design is broken into packages of related classes. Table 3-1 shows each package that is new or changed to support the Release 16 features.

Table 3-1. CHART ATMS Packages

Package Name	Package Description
chartlite.data.dms	Changes in R16 to support device commissioned date and ATMS-868.
chartlite.data.har	Changes in R16 to support device commissioned date and ATMS-868.

Package Name	Package Description
chartlite.data.onoffdevice	Changes in R16 to support device commissioned date.
chartlite.data.shazam	Changes in R16 to support device commissioned date and ATMS-868.
chartlite.data.trafficevents	Changes in R16 to support RV vehicle types and Incident Sub-Types.
chartlite.data.tss	Changes in R16 to support device commissioned date and ATMS-868.
chartlite.data.video	Changes in R16 to support device commissioned date and cctv export enhancements.
chartlite.servlet.contacts	Changes in R16 to support List of Call List Enhancements.
chartlite.servlet.dms	Changes in R16 to support device commissioned date and ATMS-868.
chartlite.servlet.har	Changes in R16 to support device commissioned date and ATMS-868.
chartlite.servlet.onoffdevice	Changes in R16 to support device commissioned date.
chartlite.servlet.shazam	Changes in R16 to support device commissioned date and ATMS-868.
chartlite.servlet.trafficevents	Changes in R16 to support RV vehicle types and Incident Sub-Types.
chartlite.servlet.tss	Changes in R16 to support device commissioned date and ATMS-868.
chartlite.servlet.video.sink	Changes in R16 to support device commissioned date.
chartlite.servlet.video.source	Changes in R16 to support device commissioned date and cctv export enhancements.
CHART2.CameraControl	Changes in R16 to support device commissioned date and cctv export enhancements.
CHART2.CameraControlModule	Changes in R16 to support device commissioned date and cctv export enhancements.
CHART2.DMSControl	Changes in R16 to support device commissioned date and ATMS-868.
CHART2.DMSControlModule	Changes in R16 to support device commissioned date and ATMS-868.
CHART2.HARControl	Changes in R16 to support device commissioned date and ATMS-868.
CHART2.HARControlModule	Changes in R16 to support device commissioned date and ATMS-868.
CHART2.HARNotification	Changes in R16 to support device commissioned date and ATMS-868.
CHART2.MonitorControl	Changes in R16 to support device commissioned date.
CHART2.MonitorControlModule	Changes in R16 to support device commissioned date.
CHART2.NotificationModule	Changes in R16 to support ATMS-536
CHART2.OnOffDeviceControl	Changes in R16 to support device commissioned date.
CHART2.OnOffDeviceModule	Changes in R16 to support device commissioned date.
CHART2.SHAZAMControlModule	Changes in R16 to support device commissioned date and ATMS-868.
CHART2.TrafficEventManagement	Changes in R16 to support RV vehicle types and incident sub-type field.
CHART2.TrafficEventModule	Changes in R16 to support RV vehicle types and incident sub-types.

Package Name	Package Description
CHART2.TSSManagement	Changes in R16 to support device commissioned date.
CHART2.TSSManagementModule	Changes in R16 to support device commissioned date and ATMS-868.
CHART2.Utility	Miscellaneous changes for R16 in support of new/changed features.
CHART2.webservices.dataexporter	Changes in R16 to export RV vehicle types and CCTV export enhancements.
CHART2.webservices.exportlistenermodule	Changes in R16 to handle exported traffic event changes and CCTV export enhancements.

3.8 Assumptions and Constraints

3.8.1 Incident Sub-Types

1. Constraint: An Incident Sub-Type assigned to an event is viewable only within the ATMS GUI and will not be exported with any event related data.

4 Human Machine Interface

4.1 RV Vehicle Types

This section describes the changes to the CHART ATMS GUI for the addition of the RV and RV with trailer vehicle types.

4.1.1 Edit Incident Information

The Edit Incident Information page is changing to add the vehicle types: RV (Involved, Overturned) and RV (with trailer) (Involved, Overturned, Lost Load, and Jack Knifed).

Incident @ I-83 NORTH AT BELFAST RD [Other]

Incident Information

Incident Type

Other▼

☐ HAZMAT

Enter each vehicle in only 1 column.
Use the "Involved" column for vehicles that are involved, but not overturned, lost load, etc.

Vehicle Count					
	Involved	Overturned	Lost Load	Jack-Knifed	TOTAL
Car	<input type="text" value="0"/>	<input type="text" value="0"/>			<input type="text" value="0"/>
Car (with trailer)	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Pickup	<input type="text" value="0"/>	<input type="text" value="0"/>			<input type="text" value="0"/>
Pickup (with trailer)	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Van	<input type="text" value="0"/>	<input type="text" value="0"/>			<input type="text" value="0"/>
Van (with trailer)	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
SUV	<input type="text" value="0"/>	<input type="text" value="0"/>			<input type="text" value="0"/>
SUV (with trailer)	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
RV	<input type="text" value="1"/>	<input type="text" value="2"/>			<input type="text" value="3"/>
RV (with trailer)	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="5"/>	<input type="text" value="6"/>	<input type="text" value="18"/>
Single Unit Truck	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>		<input type="text" value="0"/>

Figure 4-1. Edit Incident Information: RV Types

4.1.2 Event Details

The Incident Information section of the Event Details page shows the vehicle counts.

Incident Information [Edit](#)

Incident Type: Other HAZMAT: NO

Vehicle Count					
	Involved	Overtaken	Lost Load	Jack-Knifed	TOTAL
RV	1	2			3
RV (with trailer)	3	4	5	6	18
TOTAL					21

TMDD Vehicle Count:

Figure 4-2. Event Details: Vehicle Count

4.1.3 Event List

The Vehicles column on the Event List page shows the description for the new RV types.

Open Traffic Events (12) [Set Columns](#)

☐ Hide Devices



Event Description / Location	Regional	Route	Direction	Event Type	Op Center	County / State	Lane Closures	Vehicles
 Incident @ I-83 NORTH AT BELFAST RD [Other] I-83 NORTH AT BELFAST RD	NO	I-83	North	Incident (Other) edit incident data	SOC participants (0)	Baltimore County, MD		3 rvs (1 involved, 2 overturned), 18 rvs (with trailer) (3 involved, 4 overturned, 5 lost load, 6 jackknifed)

Figure 4-3. Event List: Vehicles Column

A filter value is added to allow filtering on RV types:

Open Traffic Events (FILTERED - 1 of 12 shown) [Set Columns](#)

☐ Hide Devices Filters: Vehicles Involved: **RV** [View All Open Events](#)

Event Description / Location	Regional	Route	Direction	Event Type	Op Center	County / State	Lane Closures	Vehicles
 Incident @ I-83 NORTH AT BELFAST RD [Other] I-83 NORTH AT BELFAST RD	NO	I-83	North	Incident (Other) edit incident data	SOC participants (0)	Baltimore County, MD		<div> --Any-- No Vehicles Vehicle(s) Involved 2+ Vehicle Involved 3+ Vehicles Involved Car Pickup/Van/SUV RV Single Unit Truck Tractor Trailer Motorcycle Commercial Bus School Bus Cyclist Pedestrian </div>

Response HARS:

Map Inactive NOT EXECUTED 498	Map Inactive NOT EXECUTED 499	Map Inactive NOT EXECUTED 898
-------------------------------------	-------------------------------------	-------------------------------------

Figure 4-4. Event List: Vehicles Filter

4.1.4 Other List Pages

The Vehicles description that includes the RV types also appears on the Home Page, Operations Center Report, and Property Event List pages:

 3	 0	 0	 5	 0	 4	 0	 0	 0
Name	Op Ce	Regional	County/State	Lane Closures	Vehicles			
Incident @ I-83 NORTH AT BELFAST RD [Other Location: I-83 NORTH AT BELFAST RD	SOC	<input type="checkbox"/>	Baltimore Count		3 rvs (1 involved, 2 overturned), 18 rvs (with trailer) (3 involved, 4 overturned, 5 lost load, 6 jackknifed)			

Figure 4-5. Home Page Incidents Tab: Vehicles Column

Operations Center Report For 'SOC'

[All Open Events and Devices With Active Messages In System](#)

[View Shift Handoff Report](#)

Open Traffic Events


Event Description/ Location	Op Center	Regional	Direction	Event Type	County/ State	Lane Closures	Vehicles
 Incident @ I-83 NORTH AT BELFAST RD [Other] I-83 NORTH AT BELFAST RD	SOC participants (0)	No	North	Incident (Other) edit incident data	Baltimore County, MD		3 rvs (1 involved, 2 overturned), 18 rvs (with trailer) (3 involved, 4 overturned, 5 lost load, 6 jackknifed)

Figure 4-6. Operations Center Report: Vehicles Column

Priority Events [Export](#)

shading indicates completed events

Event Location	Time Opened	Lanes Closed	Vehicles	Queue (mi)	Est. Hours To Clear	Op Ctr POC	On Scene POC	Resources	DMSs	Comments
Baltimore County Incident @ I-83 NORTH AT BELFAST RD [Other]	02/02/16 15:59 by SOC (14.07 days)	2/2 Northbound closed	3 rvs (1 involved, 2 overturned), 18 rvs (with trailer) (3 involved, 4 overturned, 5 lost load, 6 jackknifed)							

Figure 4-7. Priority Events List: Vehicles Column

4.1.5 Create Notification

The description for vehicle types that is included when suggesting notification messages for an incident will include the new RV vehicle types:

Send Notification For: Incident @ I-83 NORTH AT BELFAST RD [Other]

Available Groups	Selected Recipients
Show Individuals	
<div>ak test2 ALL (AOC) Allegany County Anne Arundel County AOC Admin Exec.Email Notification List (AOC) AOC Admin Overnight Weather Group AOC Bay Bridge Scheduled Roadwork AOC Central - Minor Incidents, Backups, etc. (AOC) AOC Central Major Incident (AOC) AOC Cmd Post-Use for all events when CP Activated AOC Grand Prix AOC ICC Major AOC ICC Minor</div>	<div></div>
Hold shift and click a group to see its members at the bottom of the page.	
Quick Find: <input type="text"/>	<input checked="" type="checkbox"/> Starts With
Message:	
<div>3 RVs (1 Involved, 2 OT), 18 RVs (with trailer) (3 Involved, 4 OT, 5 Lost Load, 6 Jackknifed)</div>	
length: 104	
<div>Suggest</div>	
Location Vehicles Lane Status	
<div>-- Facilities --</div>	
Initials: <input type="text"/>	
<div>Send</div>	<div>Cancel</div>

Figure 4-8. Create Notification Message Suggestion

4.1.6 System Profile: Notification Settings: Vehicle Type Abbreviations

The RV types are added to the System Profile page for Notification Settings, allowing the notification message suggestion to be customized for these types if desired.

Vehicle Type Abbreviations:

Abbreviations for the incident vehicle types. The field on the left is for the base vehicle type (Car, Pickup, etc.) The center field is the plural suffix, which is appended to the vehicle type name if there are multiple vehicles. The right field is the qualifier, which can be used for types that have a qualifier such as (with trailer). The suffix and/or qualifier fields can be set to empty to prevent their use. [Hide](#)

Car	Car	s	
Car (with trailer)	Car	s	(w/trailer)
Pickup	P-up	s	
Pickup (with trailer)	P-up	s	(w/trailer)
Van	Van	s	
Van (with trailer)	Van	s	(w/trailer)
SUV	SUV	s	
SUV (with trailer)	SUV	s	(w/trailer)
RV	RV	s	
RV (with trailer)	RV	s	(with trailer)
Single Unit Truck	Single Unit Trk	s	

Figure 4-9. System Profile: Notification Settings

4.1.7 Intranet Map: Event Tooltip

The tooltip shown for the incident will include the new RV vehicle types (if present).

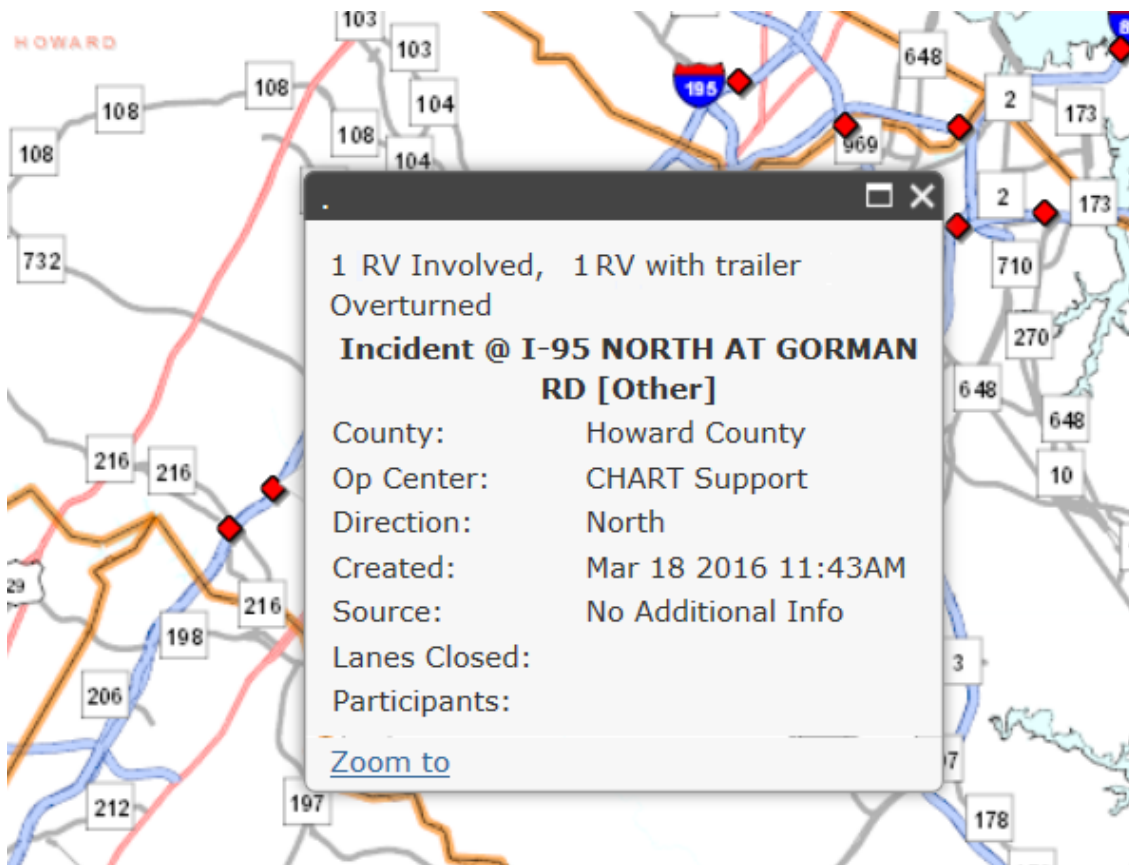


Figure 4-10. Event Tooltip with RV Vehicles

4.2 List of Call Lists Enhancement

The list of call lists, as accessed via the Call Out Lists link in the home page navigation menu, is changed such that each contact that appears in a call out list is now a link that allows the user to view the details about the contact.

Call Out Lists (4)

[Show All Contacts](#) [Hide All Contacts](#)

Name 	Type	Category	# Contacts	Contacts	Actions
AOC North	AOC North	Agency	0		Delete
CHART Unit 329	CHART Unit	CHART Unit	0		Delete
SHA District Office D6	SHA District Office	Facility	5	+	Delete
Software Developer	Software Developer	Special Needs	3	- <ul style="list-style-type: none">1. Dalrymple, Scott (CSC)2. Brennan, Chris (CSC)3. Doyle, Rich (TTC)	Delete

[Forward](#) | [Refresh](#) | [Center Rpt](#) | [Comm. Log](#) | [Instant Messaging](#) | [Home Page](#) | [Intranet Map](#) | [Traffic Ey](#)

CHART R16.0.0 2/10/2016 © 2002-2014 MDSHA. All rights reserved.

Doyle, Rich (TTC) [View](#)

Agency: TTC

Phone Numbers: a. 555-555-5555 (Work)
b. 444-444-4444 (Mobile)
c. 333-333-3333 (Home)

Call Sign: WRIK

Email: doyle@turnkey-technology.com

[Close](#)

Figure 4-11. Viewing Contact Details for a Call Out List

The contact details are shown in a pop-up that appears next to the contact link that was clicked. If the user has the right to view or edit contacts, a link appears within the popup to allow the user to view or edit the contact details via an existing form (not new for R16).

4.3 Date Commissioned Field

A new field is added for each device type to allow the date when the device is first placed into service to be recorded and viewed. This applies to DMS, HAR, SHAZAM, On/Off Devices, TSS, Cameras, and Monitors. The sections below describe the user interface changes that are made to accommodate this new field.

4.3.1 Add Device Form

The forms used to add the various types of devices to the system are changed to include a field to allow the Date Commissioned to be set. A calendar control exists and can be used to choose the date from a calendar, or the user may type the date directly in the field. The field defaults to the current date. Following is an example of the form used to add a DMS to the system. The forms used to add the other types of devices to the system have similar changes.

Add DMS

General DMS Information	
Name	<input type="text"/>
Owning Organization	-- Select --
Maintaining Organization	-- Select --
Enable Device Logging	<input type="checkbox"/>
Decision Support Eligible	<input checked="" type="checkbox"/>
Model	Addco
Display Configuration	--Select--
Travel Time Msg Arb Queue Level	Travel Time
Toll Rate Msg Arb Queue Level	Toll Rate
Date Commissioned	02/11/2016

Figure 4-12. Date Commissioned: Add DMS Form

Date Commissioned

02/11/2016

February 2016

<< < Today > >>						
Su	Mo	Tu	We	Th	Fr	Sa
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	1	2	3	4	5

Operations Center to alert on Comm Failure: Nor

Operations Center to alert on Hardware Failure: Nor

Notification groups to notify on Comm Failure: --Se

Notification groups to notifv

Figure 4-13. Date Commissioned: Calendar Control

4.3.2 Device Details Page

The device details page for any of the device types is changed to show the Date Commissioned that has been entered for the device, if any. The image below shows an example for the DMS details page. The details pages for other device types have similar changes.

Basic Settings: (Edit)

Name:	4406
Network Connection Site:	localhost
Owning Organization:	SHA
Maintaining Organization:	SHA
Device Logging:	ON
Decision Support Eligible:	YES
NTCIP Community:	public
NTCIP HDLC Framing:	OFF
Travel Time Msg Queue Level:	SHAZAM
Toll Rate Msg Queue Level:	Congestion
Date Commissioned:	02/11/2014 (2 years and 3 days ago)

Figure 4-14. Date Commissioned: DMS Details

4.3.3 Edit Device Configuration Page

The pages used to edit a device configuration are changed to allow the date commissioned to be set, edited, or removed. Like the forms used to add a device to the system, the date commissioned field includes a calendar control to allow the user to select the date from a calendar. The user may also directly enter the date or clear it. Following is an example for editing the date commissioned field for a DMS. The edit configuration forms for the other device types have similar changes.

Basic Settings For DMS: 4406

Name	<input type="text" value="4406"/>
Owning Organization	<input type="text" value="SHA"/>
Maintaining Organization	<input type="text" value="SHA"/>
Enable Device Logging	<input checked="" type="checkbox"/>
Decision Support Eligible	<input checked="" type="checkbox"/>
NTCIP Community:	<input type="text" value="public"/>
NTCIP HDLC Framing Required:	<input type="checkbox"/>
Travel Time Msg Arb Queue Level	<input type="text" value="SHAZAM"/>
Toll Rate Msg Arb Queue Level	<input type="text" value="Congestion"/>
Date Commissioned	<input type="text" value=""/>

Figure 4-15. Date Commissioned: Edit DMS Basic Settings

4.3.4 Copy Device

The form used to copy a device is also changed to include the Date Commissioned field. As is the case with the Add forms, a calendar control can be used to select the date, or the date can be entered directly into the field. The field defaults to the current date. Following is an example of the Copy DMS form. The copy form for other devices has similar changes.

Copy DMS

General DMS Information																											
Name	Copy of +FP1001 Dir N:																										
Owning Organization	SOC																										
Maintaining Organization	SOC																										
Enable Device Logging	<input type="checkbox"/>																										
Decision Support Eligible	<input checked="" type="checkbox"/>																										
Model	FP1001																										
Display Configuration	CM 3x20 FW 7x5 Beacons																										
	<table style="width: 100%;"> <tr> <td style="width: 40%;">Geometry Desc:</td> <td>char matrix, 3 x 20, char sz 7 x 5</td> </tr> <tr> <td>Display Size (HxW)(pixels):</td> <td>21 X 100</td> </tr> <tr> <td>Max Rows Per Page:</td> <td>3</td> </tr> <tr> <td>Max Characters Per Row:</td> <td>20</td> </tr> <tr> <td>Max Pages:</td> <td>2</td> </tr> <tr> <td>Beacons:</td> <td>YES</td> </tr> <tr> <td>Font:</td> <td>fw07x5s.fnt</td> </tr> <tr> <td>Line Spacing (pixels):</td> <td>N/A</td> </tr> <tr> <td>Inter-character Spacing (pixels):</td> <td>N/A</td> </tr> <tr> <td>Page Just.:</td> <td>Top</td> </tr> <tr> <td>Line Just.:</td> <td>Center</td> </tr> <tr> <td>Page On Time:</td> <td>2.5 sec</td> </tr> <tr> <td>Page Off Time:</td> <td>0 sec</td> </tr> </table>	Geometry Desc:	char matrix, 3 x 20, char sz 7 x 5	Display Size (HxW)(pixels):	21 X 100	Max Rows Per Page:	3	Max Characters Per Row:	20	Max Pages:	2	Beacons:	YES	Font:	fw07x5s.fnt	Line Spacing (pixels):	N/A	Inter-character Spacing (pixels):	N/A	Page Just.:	Top	Line Just.:	Center	Page On Time:	2.5 sec	Page Off Time:	0 sec
Geometry Desc:	char matrix, 3 x 20, char sz 7 x 5																										
Display Size (HxW)(pixels):	21 X 100																										
Max Rows Per Page:	3																										
Max Characters Per Row:	20																										
Max Pages:	2																										
Beacons:	YES																										
Font:	fw07x5s.fnt																										
Line Spacing (pixels):	N/A																										
Inter-character Spacing (pixels):	N/A																										
Page Just.:	Top																										
Line Just.:	Center																										
Page On Time:	2.5 sec																										
Page Off Time:	0 sec																										
Travel Time Msg Arb Queue Level	Travel Time																										
Toll Rate Msg Arb Queue Level	Toll Rate																										
Date Commissioned	02/19/2016																										

Figure 4-16. Date Commissioned: Copy Device

4.3.5 Device List

The device lists are changed to include a column that displays the device commissioned date. The column is hidden by default. Once viewed, it can be used to sort or filter the list. Following are examples from the DMS list.

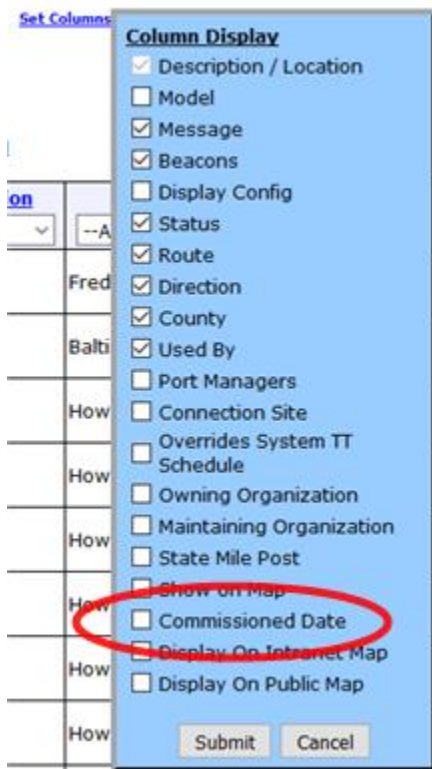


Figure 4-17. Commissioned Date Column Selection



Figure 4-18. Commissioned Date Column



Figure 4-19. Commissioned Date Column Filter

4.4 Task 104 PRs

4.4.1 ATMS-536: Improved e-mail address validation and fix for notifications that include recipient with invalid e-mail address

Two bugs related to invalid e-mail addresses are corrected under ATMS-536. The first issue is that the system did not properly flag an e-mail with two consecutive dots as being invalid, allowing it to be set a contact's e-mail. The second issue is that a notification sent that included the contact with the invalid e-mail appeared to not have been sent to any of the recipients. The status of all recipients remained as "Requested" and never changed to "Sent" or "Failed", even though the e-mails were delivered to valid e-mail addresses, and delivery failed for the invalid address. The changes to address these issues are discussed below.

Additional validation has been added for e-mail addresses, as evident on the Add/Edit Contact form. The validation will now disallow e-mail addresses that start with "@" or ".", will not allow two consecutive "." characters, and will not allow more than one "@" to be present in the address. The image below is prior to the changes for ATMS-649 which allows each contact to have multiple e-mail addresses, however the same validation will apply to each e-mail address field.

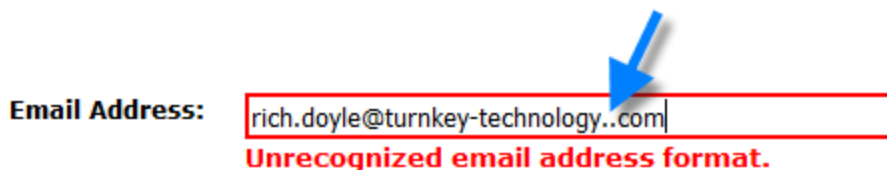


Figure 4-20. ATMS-536 E-mail Address Validation

The second issue is corrected such that when the sending of a notification results in partial success (one or more recipients had an invalid address), the system will correctly show the status of each recipient, rather than having the status stuck at “Requested”. See the example below:

Notification Details

Message: This is a test notification message; please ignore. /rwd@CHART Support@11:28

Requested Groups: Test Group

Requested Contacts:

Traffic Event: Incident @ I-70 WEST AT BILL MOXLEY RD [Other]

Sender: rdoyle (CHART Support)

Time Sent: 11:28

Status: 1 sent, 1 failed

Individual / Member	Status	Time
Contact, Test (CHART)	Sent	11:28
Contact, Test2 (CHART)	Failed (Invalid address)	11:28

Figure 4-21. ATMS-536 Notification With Invalid Address Present

4.4.2 ATMS-571: County Mileposts

The create event and edit location forms are changed such that when the user chooses to specify an intersecting feature using a county milepost, the form used to enter the milepost number will now indicate the valid range of county mileposts for the specified main route and county. See below for an example:

Intersecting Feature

Feature Type:

Milepost (mi):

☒ County MP

Figure 4-22. County Milepost: Intersecting Feature

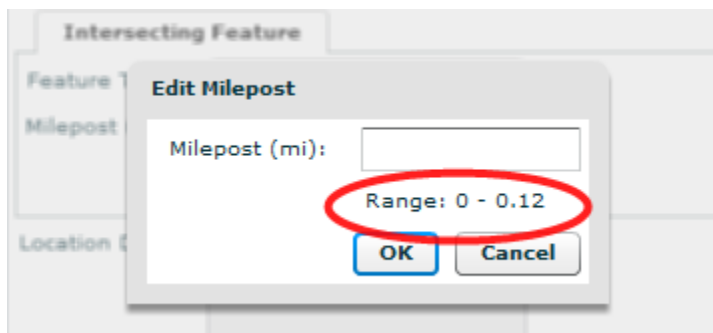


Figure 4-23. County Milepost: Valid Range

4.4.3 ATMS-597 Change Direction of South/North to North/South

When specifying the direction for a traffic event or device (except SHAZAM and DMS which do not support bi-directional locations), the selection that was previously “South/North” is now changed to “North/South” (see below). This change causes the default event naming convention to use “North/South”, and also causes the abbreviation used in a notification for a traffic event to be “N/S” instead of “S/N”.

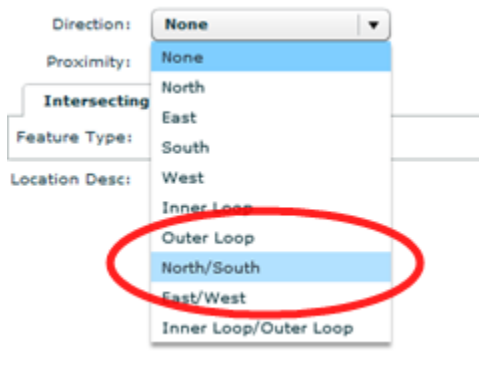


Figure 4-24. ATMS-597 Specifying North/South Direction

Incident @ I-70 NORTH/SOUTH AT BILL MOXLEY RD [Other]

(Event Open; Controlled By CHART Support)

Figure 4-25. ATMS-597 Event Name with North/South Direction

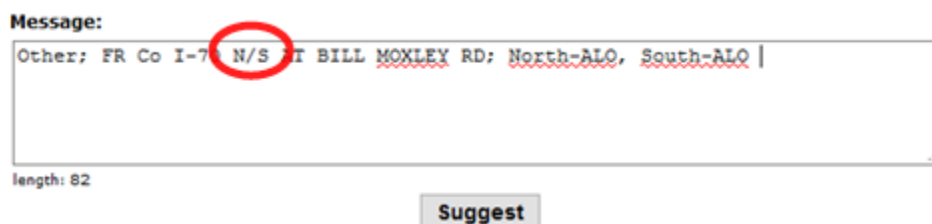


Figure 4-26. ATMS-597 Notification Suggestion with North/South Event Direction

4.4.4 ATMS-638: Correct the user right required to associate AORs with monitors

The monitor details page was using the incorrect user right to determine if the user should be shown the link to Edit the AORs associated with a monitor or to remove an existing association. This has been corrected to require the Configure Monitor right for the owning organization of the monitor (or for all organizations). The following screen shots of the monitor details page show the links as they should appear for a user that has the Configure Monitor right for the monitor, and how the page should look if the user does not have the right.

Configuration [\(Edit\)](#) [Enable Auto Mode](#)

Basic Settings:

Name:	+TESTAOC MON 1 aoc
Monitor Group(s):	+AOC lab +DEVSOC lab +BHT lab
Owning Organization:	AOC
Maintaining Organization:	AOC
Is Public:	YES
Auto Mode Enabled:	NO
Auto Mode Dwell Time	10 seconds
Date Commissioned:	N/A
Network connection site:	localhost

Transmission Settings:

Transmission Medium:	Video over IP, via CODEC
Video Fabric:	+SHA IP Fabric
IP Address / Host:	20.2.113.41
TCP Port:	5000
Decoder type:	Core Tec MPEG-4 IP-based CODEC

Areas of Responsibility: [\(Edit\)](#)

Description	Action
County Garrett	Disassociate




Figure 4-27. ATMS-638 Associate AORs with Monitor, proper user rights

Configuration [Enable Auto Mode](#)

Basic Settings:

Name:	+TESTAOC MON 1 aoc
Monitor Group(s):	+AOC lab +DEVSOCLab +BHT lab
Owning Organization:	AOC
Maintaining Organization:	AOC
Is Public:	YES
Auto Mode Enabled:	NO
Auto Mode Dwell Time	10 seconds
Date Commissioned:	N/A
Network connection site:	localhost

Transmission Settings:

Transmission Medium:	Video over IP, via CODEC
Video Fabric:	+SHA IP Fabric
IP Address / Host:	20.2.113.41
TCP Port:	5000
Decoder type:	Core Tec MPEG-4 IP-based CODEC

Areas of Responsibility:

Description
County Garrett

Figure 4-28. ATMS-638 Associate AORs with Monitor, improper user rights

4.4.5 ATMS-655: Enhanced log messages for event participants

All traffic event participant operations that include a contact (either a contact as a stand-alone participant or a contact associated with a participant via a call out list) will now include the name/agency of the contact in their event history and operations log messages. The name/agency included will be formatted exactly the same as is shown in the GUI, which depends on whether the agency is specified for the contact, first name and last name, or all 3. The sections below point out the operations affected by these enhanced log messages.

4.4.5.1 Adding a contact as a stand-alone participant



Figure 4-29. Add Contact as Participant (Link)

Contacts (1 of 615) [Set Columns](#)

Filters: Location: I-70 WEST AT GREEN VALLEY RD, Agency: TTC [View All](#) [Reset Col Filters](#)

Search Contacts: [Clear](#)

	Last Name ^Δ	First Name	Agency TTC ▼	Username	Op Center(s) --Any-- ▼	Call Sign	Office / Shop --Any-- ▼	Phone Numbers	Do N Conta
<input checked="" type="checkbox"/>	Doyle	Rich	TTC	rdoyl	CHART Support		Mount Airy	<input type="radio"/> 555-555-5555 (Work) <input type="radio"/> 444-444-4444 (Mobile) <input type="radio"/> 333-333-3333 (Home)	

Figure 4-30. Add Contact as Participant (Form)

4.4.5.2 Adding a contact to a participant from a call out list

Participant
Software Developer




Figure 4-31. Add Contact to Participant (Icon)

Choose Contact for Software Developer (Incident @ I-70 WEST AT GREEN VALLEY RD [Other]) (2 of 3) [Set Columns](#) [\(show default columns\)](#)

Filters: Location: I-70 WEST AT GREEN VALLEY RD [View All](#)

	Name / Agency	Username	Op Center(s) --Any-- ▼	Call Sign	Office / Shop --Any-- ▼	Phone Numbers
Select	1. Dalrymple, Scott (CSC)	sdalrymp	CHART Support			Select 555-555-5555 (Work) Select 444-444-4444 (Mobile)
Select	3. Doyle, Rich (TTC)	rdoyl			Mount Airy	Select 555-555-5555 (Work) Select 444-444-4444 (Mobile) Select 333-333-3333 (Home)

Figure 4-32. Add Contact to Participant (Form)

4.4.5.3 Changing the associated contact or contacted phone number

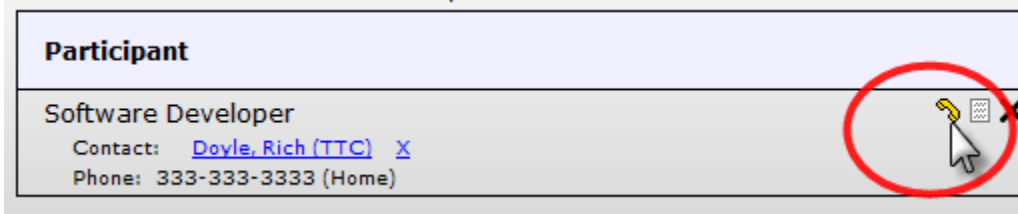


Figure 4-33. Change Participant Contact or Phone Number (Icon)

4.4.5.4 Selecting or de-selecting a phone number in the contact details popup

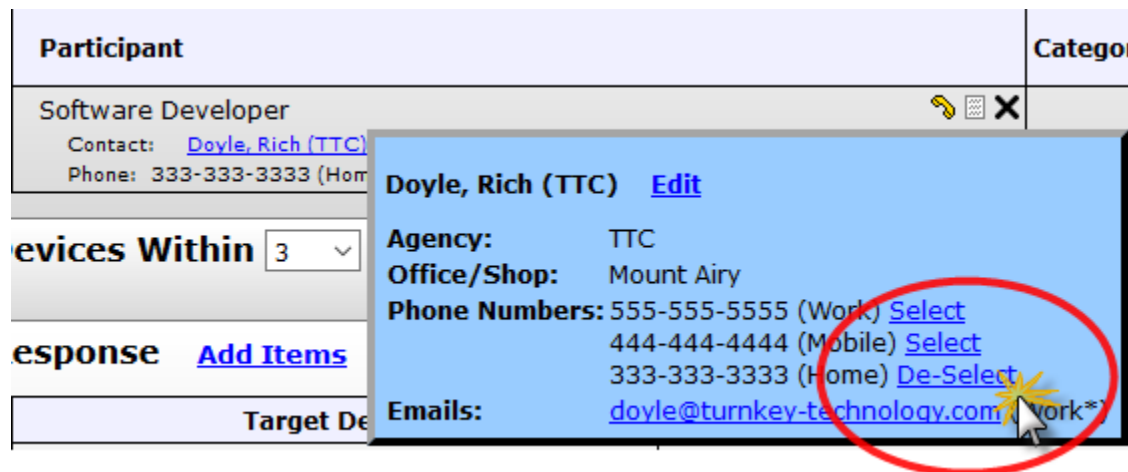


Figure 4-34. Select or De-select Phone Number for Contact

4.4.5.5 Removing the contact from a participation record

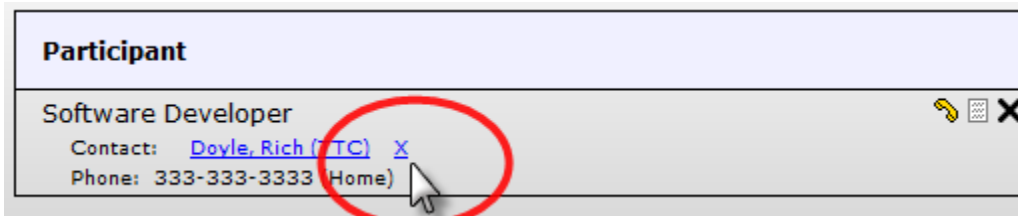


Figure 4-35. Remove Contact From Participant (Link)

4.4.5.6 Adding notes to a contact participant or participant that has associated contact

Participant
Software Developer Contact: Doyle, Rich (TTC) X Phone: 333-333-3333 (Home)




Figure 4-36. Add Notes to Participant (Icon)

Call Sign	ABC-123
Driver Name	
First	
Last	
Notes	
Submit	Cancel




Figure 4-37. Add Notes to Participant (Form)

4.4.5.7 Setting the notified, arrived/responded, or departed flags for a contact participant or participant that has associated contact

Participant	Category	Notified	Arrived / Responded	Departed
Dalrymple, Scott (CSC)	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Software Developer Contact: Doyle, Rich (TTC) X Phone: 333-333-3333 (Home)	X Special Needs	<input type="checkbox"/>	<input type="checkbox"/> M	<input type="checkbox"/> M




Figure 4-38. Participant Status Check Boxes

4.4.5.8 Overriding the notified, arrived/responded, or departed timestamps for a contact participant or participant that has associated contact

Participant	Category	Notified	Arrived / Responded	Departed
Dalrymple, Scott (CSC)		<input checked="" type="checkbox"/> 17:13	<input checked="" type="checkbox"/> 17:13	<input checked="" type="checkbox"/> 17:13
Software Developer Contact: Doyle, Rich (TTC) X Phone: 333-333-3333 (Home)	Special Needs	<input checked="" type="checkbox"/> 17:13	<input checked="" type="checkbox"/> 17:13	<input checked="" type="checkbox"/> 17:13

Devices Within Miles (4) [Show](#)

Response [Add Items](#) [Refresh](#)

Target Device	Proposed Message

Set Notified Time

Figure 4-39. Override Participant Status Time Stamp

4.4.5.9 Removing a contact participant or participant that has associated contact

Participant	Category
Dalrymple, Scott (CSC)	
Software Developer Contact: Doyle, Rich (TTC) X Phone: 333-333-3333 (Home)	Special Needs

Figure 4-40. Remove Participant From Event

4.4.6 ATMS-868: Add managed export flag for DMS, HAR, SHAZAM, and TSS

A new flag is added for DMS, HAR, SHAZAM, and TSS to indicate if the export of the device is managed via a user right. Only external clients with the ExportManaged<device type> right for the specific type of device will be able to export devices with the Managed Export flag set to true. For each of these device types, a new checkbox is added to the forms used to add a new device to the system, edit the device settings, or copy a device. The current value the flag is shown on the device's details page. A new column (initially hidden) is added to the device list for each of these device types and the column can be sorted and/or filtered. Because the changes for each device type are similar, only the changes for DMS are shown below. *Note that changes are not included in ATMS-868 for Monitors or On/Off Devices because those devices are not exported. Similar changes for Cameras are included in CHART ATMS R16 but not as part of ATMS-868; those changes are part of WO54 Export Changes.*

4.4.6.1 Add Device Form

The forms used to add DMS, HAR, SHAZAM, and TSS devices to the system are changed to allow the user to indicate if its export is managed via a user right. The example below shows the Add DMS form; the forms for the other device types will have similar changes.

Add DMS

General DMS Information	
Name	<input type="text"/>
Owning Organization	-- Select --
Maintaining Organization	-- Select --
Enable Device Logging	<input type="checkbox"/>
Decision Support Eligible	<input checked="" type="checkbox"/>
Model	Addco
Display Configuration	--Select--
Travel Time Msg Arb Queue Level	Travel Time
Toll Rate Msg Arb Queue Level	Toll Rate
Date Commissioned	03/11/2016
Managed Export	<input type="checkbox"/>

Figure 4-41. Managed Export Flag: Add Device Form

4.4.6.2 Device Details Page

The device details pages for DMS, HAR, SHAZAM, and TSS are changed to show the current status of the new Managed Export flag. The example shown below is for DMS; changes for other device types are similar.

Basic Settings: [\(Edit\)](#)

Name:	+Rich Test 1
Network Connection Site:	localhost
Owning Organization:	SHA
Maintaining Organization:	SHA
Device Logging:	OFF
Decision Support Eligible:	YES
Travel Time Msg Queue Level:	Travel Time
Toll Rate Msg Queue Level:	Toll Rate
Date Commissioned:	03/07/16 (4 days ago)
Managed Export:	NO

Figure 4-42. Managed Export Flag: Device Details

4.4.6.3 Edit Device Configuration Page

The forms used to edit the configuration of DMS, HAR, SHAZAM, and TSS devices are changed to allow the Managed Export flag to be changed. The example below is for DMS; the changes for the other device types are similar.

Basic Settings For DMS: +Rich Test 1

Name	<input type="text" value="+Rich Test 1"/>
Owning Organization	<input type="text" value="SHA"/>
Maintaining Organization	<input type="text" value="SHA"/>
Enable Device Logging	<input type="checkbox"/>
Decision Support Eligible	<input checked="" type="checkbox"/>
Travel Time Msg Arb Queue Level	<input type="text" value="Travel Time"/>
Toll Rate Msg Arb Queue Level	<input type="text" value="Toll Rate"/>
Date Commissioned	<input type="text" value="03/07/2016"/>
Managed Export	<input type="checkbox"/>

Figure 4-43. Managed Export Flag: Edit Device Configuration

4.4.6.4 Copy Device

The forms used to copy a DMS, HAR, SHAZAM, or TSS device are changed to allow the Managed Export flag to be specified. The following example shows the changes for the Copy DMS form; changes for the other devices are similar.

Copy DMS

General DMS Information	
Name	<input type="text" value="Copy of +Rich Test 1"/>
Owning Organization	<input type="text" value="SHA"/>
Maintaining Organization	<input type="text" value="SHA"/>
Enable Device Logging	<input type="checkbox"/>
Decision Support Eligible	<input checked="" type="checkbox"/>
Model	<input type="text" value="Addco"/>
Display Configuration	<input type="text" value="CM 1x3 FW 7x5"/>
<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>Geometry Desc:</p> <p>Display Size (HxW)(pixels):</p> <p>Max Rows Per Page:</p> <p>Max Characters Per Row:</p> <p>Max Pages:</p> <p>Beacons:</p> <p>Font:</p> <p>Line Spacing (pixels):</p> <p>Inter-character Spacing (pixels):</p> <p>Page Just.:</p> <p>Line Just.:</p> <p>Page On Time:</p> <p>Page Off Time:</p> </div> <div style="width: 35%;"> <p>char matrix, 1 x 3, char sz 7 x 5</p> <p>7 X 15</p> <p>1</p> <p>3</p> <p>2</p> <p>NO</p> <p>fw07x5s.fnt</p> <p>N/A</p> <p>N/A</p> <p>Top</p> <p>Center</p> <p>2.5 sec</p> <p>0 sec</p> </div> </div>	
Travel Time Msg Arb Queue Level	<input type="text" value="Travel Time"/>
Toll Rate Msg Arb Queue Level	<input type="text" value="Toll Rate"/>
Date Commissioned	<input type="text" value="03/11/2016"/>
Managed Export	<input type="checkbox"/>

Figure 4-44. Managed Export Flag: Copy Device Form

4.4.6.5 Device List

The device lists for DMS, HAR, SHAZAM, and TSS devices are changed to add a column for the Managed Export flag. This column is hidden by default. When displayed, the user can sort or filter on this column. The examples below are for the DMS list; changes to the other device lists are similar.

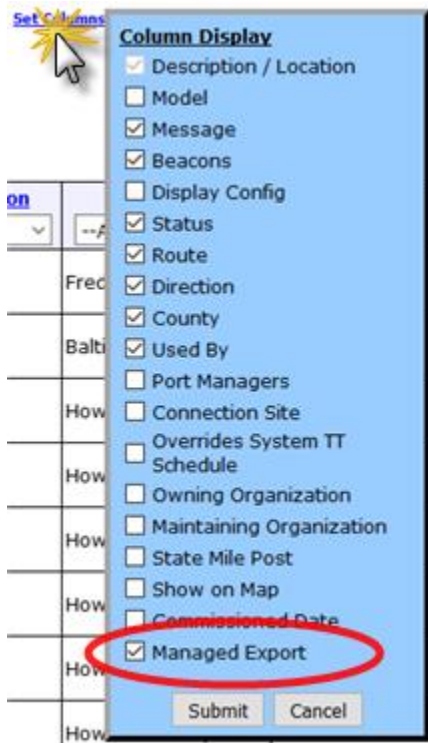


Figure 4-45. Managed Export Flag: Device List Column Selection

Managed Export
--Any--
YES
YES
NO

Figure 4-46. Manage Export Flag: Device List Column

Managed Export
--Any--
--Any--
YES
NO
YES

Figure 4-47. Manage Export Flag: Device List Filters

4.5 ATMS-1805 Remove Create/View Pending Event Links for Permits

After the deployment of CHART ATMS R15 it was discovered that the ability to create a new pending planned closure event or to view an existing pending plan closure event from the list of permits on the ATMS op center report or from the permit search results page was leading some users to not remember to activate or queue the permit. Instead they would open the pending event and because the associated permit was not active or queued, the system's background thread would close the event, unbeknownst to the user. These links have been removed to drive the users to utilize the Activate and Queue links, both of which will create or display the associated pending event but also activate or queue the permit as desired.

The following changes to the op center report permit list are highlighted in the image below:

1. When an event (pending or open) is associated with a permit, the ATMS event name shown below the permit name is no longer a link to the event details page
2. The Create Pending Event link, which used to exist when no event is currently associated with a permit, has been removed
3. The View Pending Event link, which used to exist when a pending (not open) event is associated with a permit, has been removed. (Note that the View Open Event link, present when an open event is associated with a permit, has not been removed)

Permits Active Within the Next 2 Hours (8) [\(Hide\)](#)

Tracking Number	Lanes	Begin	End	Status	Days	Route	Counties (begin/end)	Actions
D4-5616261 Permit: I-95 SOUTH AT EXIT 54 MD 2 HANOVER ST Event: I-95 SOUTH AT EXIT 54 MD 2 HANOVER ST	Simulated lane closure desc. indicates lanes permitted to be closed.	10:15	18:15	Active (Pending Event)	M Tu W Th F Sa	I-95 S	Baltimore City	Deactivate Extend
D3-2973626 Permit: I-95 SOUTH FROM EXIT 54 MD 2 HANOVER ST (NB) TO EXIT 50A-B US 1 CATON AVE (SB)	Simulated lane closure desc. indicates lanes permitted to be closed.	14:00	17:00	Permitted (No Event)	Tu Th Sa	I-95 S	Baltimore City	Activate
D8-6875933 Permit: I-95 SOUTH AT EXIT 54 MD 2 HANOVER ST	Simulated lane closure desc. indicates lanes permitted to be closed.	14:15	21:15	Permitted (No Event)	Su Tu W Th F Sa	I-95 S	Baltimore City	Activate
D8-6455431 Permit: I-95 SOUTH FROM HANOVER ST TO CATON AVE	Simulated lane closure desc. indicates lanes permitted to be closed.	15:30	18:30	Future - Queueable (0:10) (No Event)	M W Th F Sa	I-95 S	Baltimore City	Queue
D1-4749001 Permit: I-95 SOUTH FROM HANOVER ST TO CATON AVE	Simulated lane closure desc. indicates lanes permitted to be closed.	16:15	22:15	Future - Queueable (0:55) (No Event)	M Tu Th Sa	I-95 S	Baltimore City	Queue
D5-7146926 Permit: I-95 SOUTH FROM HANOVER ST TO CATON AVE	Simulated lane closure desc. indicates lanes permitted to be closed.	16:15	20:15	Future - Queueable (0:35) (No Event)	Su M Tu W Th	I-95 S	Baltimore City	Queue
D6-4077643 Permit: I-95 SOUTH FROM HANOVER ST TO CATON AVE Event: I-95 SOUTH FROM HANOVER ST TO CATON AVE	Simulated lane closure desc. indicates lanes permitted to be closed.	15:30	18:30	Queued (Pending Event)	W Th F	I-95 S	Baltimore City	Deactivate Extend
D8-7688433 Permit: I-95 SOUTH FROM HANOVER ST TO CATON AVE Event: I-95 SOUTH FROM HANOVER ST TO CATON AVE	Simulated lane closure desc. indicates lanes permitted to be closed.	13:45	19:45	Active (Open Event)	M Tu W Th F Sa	I-95 S	Baltimore City	Deactivate Extend View Open Event

Figure 4-48. ATMS-1805 Op Center Report Changes

Similar changes have been made to the permit search results page as highlighted in the image below:

1 matching permit found.
Matches are shown in order of search relevance.

D4-5616261 Permit: I-95 SOUTH AT EXIT 54 MD 2 HANOVER ST Event: I-95 SOUTH AT EXIT 54 MD 2 HANOVER ST Deactivate Extend 100% match	1 closure desc. indicates lanes permitted	Active (Pending Event)	Route: I-95 S Start Date/Time: 04/06/16 10:15 End Date/Time: 05/02/16 18:15 Days of week: M Tu W Th F Sa Counties (begin/end): Baltimore City Show Details
--	--	---------------------------	---

Figure 4-49. ATMS-1805 Permit Search Changes Example 1

1 matching permit found.
Matches are shown in order of search relevance.

D8-6875933 Permit: I-95 SOUTH AT EXIT 54 MD 2 HANOVER ST Activate 100% match	2	Simulated lane closure desc, indicates lanes permitted to be closed.	Permitted (No Event)	Route: I-95 S Start Date/Time: 03/31/16 14:15 End Date/Time: 04/21/16 21:15 Days of week: Su Tu W Th F Sa Counties (begin/end): Baltimore City Show Details
--	---	--	-------------------------	---

Figure 4-50. ATMS-1805 Permit Search Changes Example 2

1 matching permit found.
Matches are shown in order of search relevance.

D5-7146926 Permit: I-95 SOUTH FROM HANOVER ST TO CATON AVE Event: I-95 SOUTH FROM HANOVER ST TO CATON AVE Dequeue 100% match	3	Simulated lane closure desc, indicates lanes permitted to be closed.	Queued (Pending Event)	Route: I-95 S Start Date/Time: 03/25/16 16:15 End Date/Time: 04/10/16 20:15 Days of week: Su M Tu W Th Counties (begin/end): Baltimore City Show Details
---	---	--	---------------------------	--

Figure 4-51. ATMS-1805 Permit Search Changes Example 3

4.6 CCTV Export Enhancements

Two new fields added to Camera Configuration. The managed export flag is used to identify cameras that require the Export Managed Camera functional right for the purpose of export to downstream systems. Optional camera categories can now be specified for a camera similar to regions. For each camera a user may specify 0,1 or more camera categories (Strings) by selecting from a system wide list of supported categories. This list is configured in the system profile. Camera categories are used by downstream systems to group cameras.

One new field added to Streaming Server Configuration. For each Streaming Server Configuration a Zone is specified. Possible values are Public, Internal, SWGI, and MVIEW.


4.6.1 System Profile

The Camera Related Settings page in the System Profile provides the user interface to specify the system wide list of camera categories used when configuring cameras in CHART ATMS.

Camera Related Settings

System Wide Camera Minimum Dwell Time

Hours Minutes Seconds
 0 0 10

Camera Categories 

These fields specify the names of camera categories that are available when adding or editing a camera. Categories are primarily for export and are used by downstream systems (Ex. CHART Web) for grouping cameras.

Annapolis	Baltimore	Eastern Shore	MD200/ICC	Southern MD
Wash.DC	Western MD			

Figure 4-52. CCTV Export Enhancements: Camera Related Settings

Streaming Server Configurations (9) [Set Columns](#)

[New Streaming Server Configuration](#)

Name	Internal Host/IP	Command Port	Is Public	Zone	External Host/IP	Cameras Using	Actions (*)
AACounty	10.225.129.41	8080	YES	Public	aaco-dmz-sfs-01	8 view	Edit
Intranet	10.92.211.84	8080	NO	Internal	170.93.143.150	720 view	Edit
mobile1	10.95.247.28	8080	YES	Public	170.93.143.139	145 view	Edit

Figure 4-53. CCTV Export Enhancements: Streaming Server Configuration List

Edit Streaming Server Configuration

Name:

Internal Host/IP:

Command Port:

User Name:

Password:

Is Public: ☒

External Host/IP:

URL Template:

Zone:

Public
 Internal
 SWGI
 MVIEW




Figure 4-54. CCTV Export Enhancements: Add / Edit Streaming Server Configuration


4.6.2 Camera Details Page

The camera details page is changed to show the managed export flag, camera categories and Streaming Server Zones.

Camera : SIM 16th St (MD 390) & Spring St
16th St (MD 390) & Spring St

Status

Controlled By: Op Center:
User:

Operational Status:  Online

Displayed On Monitors:
None

Video Sessions: Active sessions: 0

Directly Connected To: None

Last Status Time: Device Status: N/A
Monitor Status: 07/29/14 05:52

Display Blocked To Monitors: YES

Flash Server Status For This
Camera:

Name	Host (Internal)	Host (External)	Public?	Zone	Status	Action
Intranet	10.92.211.84	170.93.143.150	NO	Internal	Not Blocked	Unblock Block
mobile3	10.95.247.33	170.93.143.141	YES	Public	Not Blocked	Unblock Block
SWGI	10.95.242.29	otts-gburnie-104-r2r1-sfs1	NO	SWGI	Not Blocked	Unblock Block

Display Blocked For Organizations: None

Control Blocked For Organizations: None

Figure 4-55. CCTV Export Enhancements: Camera Details - Status Section

Video Streaming Server Settings:

Intranet: Internal Host/IP: 10.92.211.84
Command Port: 8080
Login Name: operator
Password: sfs1000

Is Public: NO
Zone: Internal
External Host/IP: 170.93.143.150
URL Pattern: rtmp://<host>/rtplive/<streamID>
URL (external host): rtmp://170.93.143.150/rtplive/3a01252801150075004d823633235daa
URL (internal host): rtmp://10.92.211.84/rtplive/3a01252801150075004d823633235daa

Figure 4-56. CCTV Export Enhancements: Camera Details – Streaming Server Section

Camera Settings:

Camera Number: 1
Regions: AA Co.
AOC

Decision Support Eligible: YES
Is Mobile: YES
Managed Export: YES
Categories: Eastern Shore

Date Commissioned: 03/01/16 (13 days ago)

Figure 4-57. CCTV Export Enhancements: Camera Details – General Settings

4.6.3 Add / Edit Camera Page

The Add / Edit Cameras page changes to allow the user to set the managed export flag and to specify optional camera categories. It also displays the Zone in the Streaming Server Configuration section.

Switch(s) [Add](#)
Video Streaming Server Configuration(s) [Add](#)

Name	Internal Host Fields (For Blockable SFSS)				Is Public?	Zone	External Host/IP	Alt. Stream ID	
	Internal Host/IP	Port	Login	Password					
Intranet	10.92.211.84	8080	operator	sfs1000	YES	Public	170.93.143.150		Remove
mobile3	10.95.247.33	8080	operator	sfs1000	YES	SWGI	170.93.143.141		Remove
SWGI	10.95.242.29	8080	operator	sfs1000	NO	Internal	otts-gburnie-104-r2r1-sfs1		Remove
mobile4	10.95.247.31	8080	operator	sfs1000	YES	Internal	170.93.143.138		Remove

• The internal/external host, command port, public flag, and URL pattern used for video streaming from a given server is specified in the System Profile.
• By default the stream ID is the video source's 32-character CHART ID, which is the convention usually used for identifying a stream in CHART SFSS; however, it can be overridden using the Alternate Stream ID field. This allows any stream ID to be used, and a different stream ID for each video server, if necessary.
• Prior to using streaming from a Streaming Flash Server (SFS), streams must exist on the streaming and transcoding servers. For more information regarding streams, please refer to the Skyline TS1000 and SFS1000 user manuals.

Camera Number

Regions (OPTIONAL)

AA Co.

AOC

BHT Tunnel

Balt. Co.

FMT Tunnel

Decision Support Eligible ☒

Is Mobile ☒

Managed Export ☒

Categories (OPTIONAL)

Annapolis

Baltimore

Eastern Shore

MD200

Montgomery County

Date Commissioned

Figure 4-58. CCTV Export Enhancements: Add / Edit Camera Page

4.6.4 Camera List

The Camera List will be changed to add 2 new columns: Camera Categories, Managed Export. These 2 new optional columns will be sortable and filterable like other columns.

4.7 Incident Sub-Types

This section describes the changes to the CHART ATMS GUI for selecting an incident sub-type and managing the pre-defined sub-types for incident types.

4.7.1 Edit Incident Information Form

The Edit Incident Information page is updated to allow selection of a sub-type from a list of pre-defined types respective to the incident type. The user must have Manage Traffic Events and View Sensitive Traffic Event Information rights.

CHART [Main Window](#) [Help](#)

Incident @ I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE) [Disabled In Roadway]

Incident Information

Incident Type
 Disabled In Roadway

Incident Sub-Type
 (Dropdown menu showing sub-types)

☐ HAZMAT

Enter each vehicle in only 1 column.
 Use the "Involved" column for vehicles that are involved, but not overturned, lost load, etc.

Vehicle Count

Figure 4-59. Incident Sub-Types: Edit Incident Information

Updating the Incident Type will automatically refresh the list of sub-types to the currently pre-defined sub-types for the incident type selected.

CHART [Main Window](#) [Help](#)

Incident @ I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE) [Collision, Fatality]

Incident Information

Incident Type
 Collision, Fatality

Incident Sub-Type
 (Dropdown menu showing sub-types)

☐ HAZMAT

Enter each vehicle in only 1 column.
 Use the "Involved" column for vehicles that are involved, but not overturned, lost load, etc.

Vehicle Count

Figure 4-60. Incident Sub-Types: Edit Incident Information – Change Incident Type

For a user with the Manage Traffic Events right, but without the View Sensitive Traffic Event Information right, the Incident Sub-Type selection box and any current assigned sub-type will be hidden from display. **Note:** If this user without rights changes and submits a different incident type, the sub-type will be set to optional for the incident and all users viewing the event.

CHART [Main Window](#) [Help](#)

Incident @ I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE) [Collision, Personal Injury]

Incident Information

Incident Type
 Collision, Fatality

☐ HAZMAT

Enter each vehicle in only 1 column.
 Use the "Involved" column for vehicles that are involved, but not overturned, lost load, etc.

Vehicle Count

Figure 4-61. Incident Sub-Types: Edit Incident Information – No Rights

4.7.2 Events Details Page

Once an Incident Sub-Type is assigned to an incident event, a user with the View Sensitive Traffic Event Information and View Traffic Event Information rights may view the incident sub-type name on the Event Details page within the window title, page title, and event name field.

Incident @ I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE) [Collision, Fatality]
→ [CF Sub-Type 1]
(Event Open; Controlled By SOC)

[General Info](#) [Incident Info](#) [Roadway Conditions](#) [Participation](#) [Response](#) [Notification](#) [Event History](#) [Summary](#) [Associated Events](#) [SOP Guidance](#)

General [Edit General](#) [Edit Location](#) [Show on Map](#) [Add To Log](#)

Event Name	Incident @ I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE) [Collision, Fatality][CF Sub-Type 1]	Location Description	I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE)
Source	Field Unit (5665 (CHART Unit))	County	Baltimore City
Scope of Impact	Event Location	Region	

Figure 4-62. Incident Sub-Types: Event Details

4.7.3 Events Details Page – Incident Information Section

For a user with appropriate rights, an incident sub-type assigned to an event is also viewable in Incident Information section on the Event Details Page.

Incident Information [Edit](#)

Incident Type: Collision, Fatality HAZMAT: NO
Incident Sub-Type: CF Sub-Type 1

Vehicle Count					
	Involved	Overturned	Lost Load	Jack-Knifed	TOTAL
Car (with trailer)	1	0	1	0	2
Pickup (with trailer)	1	1	1	1	4

Figure 4-63. Incident Sub-Types: Event Details – Incident Info Section

For a user without the View Sensitive Traffic Event Information right, the sub-type field will be hidden from display.

Incident Information [Edit](#)

Incident Type: Collision, Personal Injury HAZMAT: NO

Vehicle Count					
	Involved	Overturned	Lost Load	Jack-Knifed	TOTAL
Car (with trailer)	1	0	1	0	2
Pickup (with trailer)	1	1	1	1	4

Figure 4-64. Incident Sub-Types: Event Details – Incident Info Section No Rights

4.7.4 Edit Basic Information Page

For a user with appropriate rights, an incident sub-type assigned to an event is also viewable on the Edit Basic Information Page within the event name heading.

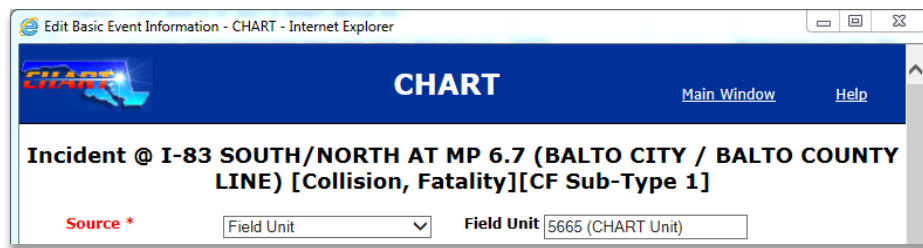


Figure 4-65. Incident Sub-Types: Edit Basic Information Page

4.7.5 View Incident Sub-Types List Page


The new Incident Sub-Types List page is added under the Traffic Event Settings section in the system profile. A user with the Configure Systems right may view incident sub-types, add sub-type(s) under any of the current 17 incident types, edit a sub-type, and remove one or more sub-types from a parent incident type.

Traffic Event Settings

Incident Sub-Types Definitions [view / edit](#)

Definitions of the sub-types for each incident type supported by the system.

Figure 4-66. Incident Sub-Types: System Profile Link



Comm Log

Source

Other (no info)

Text

Add

Search:

Search

Adv.

[Toggle Menu](#) | [Recent Events](#) | [Back](#) | [Forward](#) | [Refresh](#) | [Center Rpt](#) | [Comm. Log](#) | [Instant Messaging](#) | [Home Page](#)
[Intranet Map](#) | [Traffic Events](#) | [Help](#)

Incident Sub-Types List

Incident Type	Sub-Types	Actions
Collision, Fatality	CF Sub-Type 1 Edit Remove	Add Remove All
	CF Sub-Type 2 Edit Remove	
	CF Sub-Type 3 Edit Remove	
Collision, Personal Injury	CPI Sub-Type 1 Edit Remove	Add Remove All
Collision, Property Damage	CPD Sub-Type 1 Edit Remove	Add Remove All
Debris In Roadway	DEBIR Sub-Type 1 Edit Remove	Add Remove All
Disabled In Roadway	DISIR Sub-Type 1 Edit Remove	Add Remove All
Emergency Roadwork	ER Sub-Type 1 Edit Remove	Add Remove All
	ER Sub-Type 2 Edit Remove	
	ER Sub-Type 3 Edit Remove	
	ER Sub-Type 4 Edit Remove	
Off Road Activity	ORA Sub-Type 1 Edit Remove	Add Remove All
Other	OTH Sub-Type 1 Edit Remove	Add Remove All
	OTH Sub-Type 2 Edit Remove	
	OTH Sub-Type 3 Edit Remove	
Police Activity	PA Sub-Type 1 Edit Remove	Add Remove All
Utility Problem	UT Sub-Type 1 Edit Remove	Add Remove All
Vehicle Fire	VEHF Sub-Type 1 Edit Remove	Add Remove All
Weather Closure	WC Sub-Type 1 Edit Remove	Add Remove All
	WC Sub-Type 2 Edit Remove	
Weather Closure, Debris	WCDEB Sub-Type 1 Edit Remove	Add Remove All
Weather Closure, Utility	WCUT Sub-Type 1 Edit Remove	Add Remove All
Weather Closure, High Water	WCHW Sub-Type 1 Edit Remove	Add Remove All
Weather Closure, Winter Precip.	WCWP Sub-Type 1 Edit Remove	Add Remove All


Submit

Cancel

Figure 4-67. Incident Sub-Types: View/Manage Incident Sub-Types List Page

A single incident sub-type may be removed by clicking on the Remove link associated with the specific sub-type name. A confirmation message is displayed with the selected sub-type name to remove.

Message from webpage



Are you sure you want to remove sub-type: CF Sub-Type 1?

OK

Cancel

Figure 4-68. Incident Sub-Types: Remove Single Incident Sub-Type

All incident sub-types under a specific parent incident type may be removed at once by clicking on the Remove All link in the Actions column corresponding to the incident type row.

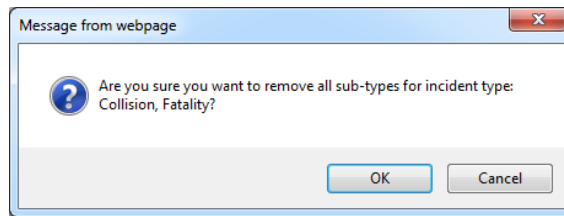


Figure 4-69. Incident Sub-Types: Remove All Incident Sub-Types For Parent

4.7.6 Add/Edit Incident Sub-Type Page

A user with the Configure Systems right may add an incident sub-type for any of the current defined incident types in the system by clicking the Add link under the Actions column for a specific parent incident type. A section for the current sub-types is included on the page. For an add operation, these will be all available incident sub-types for the parent incident type.

Figure 4-70. Incident Sub-Types: Add Incident Sub-Type For Parent

A user with the Configure Systems right may edit any incident sub-type by clicking on the Edit link next to the specific sub-type name. On the Edit Incident Sub-Type page, the incident sub-type name field is pre-populated with the current name text. The list of current sub-types (if any) will not include the current sub-type being updated.

Figure 4-71. Incident Sub-Types: Edit Incident Sub-Type

An error message is displayed during the Add or Edit operation if the sub-type name submitted is a duplicate of any other sibling sub-type(s) within the parent incident type. **Note:** A change in letter case in the sub-type name when performing an Edit operation will not display the duplicate name error message.

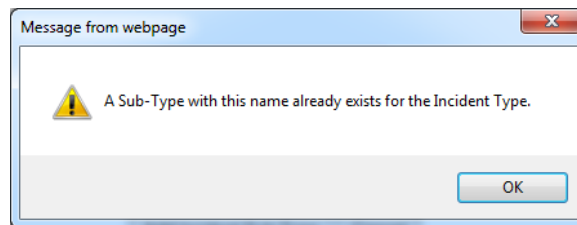


Figure 4-72. Incident Sub-Types: Duplicate Incident Sub-Type Name Error Message

4.7.7 Search Traffic Event By Incident Sub-Type

A user with View Sensitive Traffic Information and View Traffic Event Information rights may search for an incident traffic event from the Home Page using the Incident Sub-Type Name. Any incident events currently assigned with the incident sub-type in the incident name will be included in the matched results. **Note:** The Traffic Events checkbox must be selected in the Advanced Search criteria.

Advanced Search Form - CHART - Internet Explorer

Comm Log Source Other (no info) Text Search: CF Sub-Type Add Search Adv.

[Toggle Menu](#) | [Recent Events](#) | [Back](#) | [Forward](#) | [Refresh](#) | [Center Rpt](#) | [Comm. Log](#) | [Instant Messaging](#) | [Home Page](#) | [Intranet Map](#) | [Traffic Events](#) | [Help](#)

Advanced Search

CF Sub-Type

Case Sensitive ☐

Select the item types that should be included in the search.

☒ Traffic Events ☒ Highway Message Signs

☒ Highway Advisory Radios ☒ Operations Centers

☒ Detectors ☒ SHAZAMs

☒ Plans ☒ Cameras

☒ Monitors ☒ Video Tours

☒ On/Off Devices

Search

Search Results

Searched for: 'CF Sub-Type'

Search was not case sensitive

Traffic Events

Event Description / Location	Direction	Type	Op Center	County / State
Incident @ I-70 WEST AT RIDGE RD [Collision, Fatality] [CF Sub-Type 2] I-70 WEST AT RIDGE RD	West	Incident (Collision, Personal Injury)	SOC	Carroll County, MD
Incident @ I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE) [Collision, Fatality] [CF Sub-Type 1] I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE)	South/North	Incident (Collision, Personal Injury)	SOC	Baltimore City, MD

Figure 4-73. Incident Sub-Types: Search Results For Event By Incident Sub-Type

4.7.8 Open Events List Page

For a user with appropriate rights, an incident sub-type assigned to an event is also viewable on the Open Traffic Events List page within the event name link. The Edit Incident Information Form is also accessible from this list page. (See [4.6.1](#) Edit Incident Information Form).

Comm Log Source Other (no info) Text Add

[Toggle Menu](#) | [Recent Events](#) | [Back](#) | [Forward](#) | [Refresh](#) | [Center Rpt](#) | [Comm. Log](#) | [Instant Messaging](#) | [Home Page](#) | [Intra](#)

Open Traffic Events (82) [Set Columns](#) [\(show default columns\)](#)

☐ Hide Devices

Event Description / Location	Time Opened	Route	Direction	Event Type ^Δ
Incident @ I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE) [Collision, Fatality] [CF Sub-Type 1] I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE)	09/30/15 15:58	I-83	South/North	Incident (Collision, Fatality) edit incident data
Incident @ US 50 EAST/WEST AT MP 0 (WASH. DC / MD STATE LINE) [Collision, Property Damage] [CPD Sub-Type 1] US 50 EAST/WEST AT MP 0 (WASH. DC / MD STATE LINE)	09/30/15 14:33	US 50	East/West	Incident (Collision, Property Damage) edit incident data
Incident @ I-95 SOUTH AT 495 SPLIT [Collision, Personal Injury] [CPI Sub-Type 1] I-95 SOUTH AT 495 SPLIT	09/15/15 12:57	I-95	South	Incident (Collision, Personal Injury) edit incident data

Figure 4-74. Incident Sub-Types: Sub-Type On Open Events List

4.7.9 Open/Closed Events List Page

For a user with appropriate rights, an incident sub-type assigned to an event is also viewable on the Open/Closed Traffic Events List page within the event name link. The Edit Incident Information Form is also accessible from this list page. (See [4.6.1](#) Edit Incident Information Form).




<div>  <div> Comm Source Log Other (no info) </div> <div> Text </div> <div>Add</div> </div>					
Toggle Menu Recent Events Back Forward Refresh Center Rpt Comm. Log Instant Messaging Home Page					
Traffic Events (83) Set Columns (show default columns)					
<input type="checkbox"/> Hide Devices					
Event Description / Location	Time Opened	Regional	Route	Direction	Event Type Δ
 Incident @ US 50 EAST/WEST AT MP 0 (WASH. DC / MD STATE LINE) [Utility Problem][UT Sub-Type 1] US 50 EAST/WEST AT MP 0 (WASH. DC / MD STATE LINE)	12:50	NO	US 50	East/West	Incident (Utility Problem)
 Incident @ I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE) [Collision, Fatality][CF Sub-Type 1] I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE)	09/30/15 15:58	NO	I-83	South/North	Incident (Collision, Fatality) edit incident data

Figure 4-75. Incident Sub-Types: Sub-Type On Open/Closed Events List

4.7.10 Pending Events List Page

For a user with appropriate rights, an incident sub-type assigned to an event is also viewable on the Pending Traffic Events List page within the event name link. The Edit Incident Information Form is also accessible from this list page. (See [4.6.1](#) Edit Incident Information Form).





<div>  <div> Comm Source Log Other (no info) </div> <div> Text </div> <div>Add</div> </div> <div> Search: </div> <div>Search Adv.</div>						
Toggle Menu Recent Events Back Forward Refresh Center Rpt Comm. Log Instant Messaging Home Page Intranet Map Traffic Events Help						
Pending Traffic Events (FILTERED - 43 of 43 shown) (Add) Set Columns (show default columns)						
Filters: Planned Closure with Associated Permit: false View All Pending Events						
Event Description / Location	Regional	Route	Direction	Event Type Δ	County / State	Lane Closures
 Incident @ US 50 WEST AT MP 34.3 (BAY BRIDGE) [Collision, Property Damage][CPD Sub-Type 1] US 50 WEST AT MP 34.3 (BAY BRIDGE)		US 50	West	Incident (Collision, Property Damage) edit incident data	Queen Anne's County, MD	
 Incident @ MD 25 EAST AT GREENSPRING VALLEY RD [Emergency Roadwork][ER Sub-Type 4] MD 25 EAST AT GREENSPRING VALLEY RD	NO	MD 25	East	Incident (Emergency Roadwork) edit incident data	Baltimore County, MD	

Figure 4-76. Incident Sub-Types: Sub-Type On Pending Events List

4.7.11 Operations Center Report Page

For a user with appropriate rights, an incident sub-type assigned to an event is also viewable on the Operations Center Report List page within the event name link. The Edit Incident Information Form is also accessible from this list page. (See [4.6.1](#) Edit Incident Information Form).





<div>  <div>Comm Source Text</div> <div>Log Other (no info) <input type="text"/></div> </div> <div> Toggle Menu Recent Events Back Forward Refresh Center Rpt Comm. Log Instant Messaging Home </div>						
Operations Center Report For 'SOC' All Open Events and Devices With Active Messages In System View Shift Handoff Report						
Open Traffic Events						
Event Description/ Location	Op Center	Regional	Direction	Event Type	County/ State	Lane Closures
 Incident @ I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE) [Collision, Fatality][CF Sub-Type 1] I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE)	<div>SOC</div> <div>participants (2)</div>	No	South/North	Incident (Collision, Fatality) edit incident data	Baltimore City, MD	 edit
 Incident @ US 50 EAST/WEST AT MP 0 (WASH. DC / MD STATE LINE) [Collision, Property Damage][CPD Sub-Type 1] US 50 EAST/WEST AT MP 0 (WASH. DC / MD STATE LINE)	<div>SOC</div> <div>participants (4)</div>	No	East/West	Incident (Collision, Property Damage) edit incident data	Prince George's County, MD	

Figure 4-77. Incident Sub-Types: Sub-Type On Operations Center Report

4.7.12 Open Events And Devices With Active Messages List Page

For a user with appropriate rights, an incident sub-type assigned to an event is also viewable on the All Open Events and Devices With Active Messages In System List Page within the event name link. The Edit Incident Information Form is also accessible from this list page. (See [4.6.1 Edit Incident Information Form](#)).






<div>  <div>Comm Source Text</div> <div>Log Other (no info) <input type="text"/></div> </div> <div> Toggle Menu Recent Events Back Forward Refresh Center Rpt Comm. Log Insta </div>				
Open Traffic Events <input type="checkbox"/> Hide Devices In Event List				
Event Description/ Location	Direction	Event Type	County/ State	Lane Closures
 Incident @ I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE) [Collision, Fatality][CF Sub-Type 1] I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE)	South/North	Incident (Collision, Fatality) edit incident data	Baltimore City, MD	 edit
 Incident @ US 50 EAST/WEST AT MP 0 (WASH. DC / MD STATE LINE) [Collision, Property Damage][CPD Sub-Type 1] US 50 EAST/WEST AT MP 0 (WASH. DC / MD STATE LINE)	East/West	Incident (Collision, Property Damage) edit incident data	Prince George's County, MD	

Figure 4-78. Incident Sub-Types: Sub-Type On Open Events And Devices With Active Messages

4.7.13 Home Page Events Tab

For a user with appropriate rights, an incident sub-type assigned to an event is also viewable on the Home Page Events Tab within the event name link. **Note:** The incident sub-type selected for an event will not be displayed in the Resources Tab Assigned Events column, or on the Create Events Tab.

Events: 70	Resources	Alerts	Map	Create Events
------------	-----------	--------	-----	---------------

 24	 3	 1	 4	 1
--	---	---	---	---

Name	Op Center
Incident @ I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE) [Collision, Fatality][CF Sub-Type 1] Location: I-83 SOUTH/NORTH AT MP 6.7 (BALTO CITY / BALTO COUNTY LINE)	SOC
Incident @ US 50 EAST/WEST AT MP 0 (WASH. DC / MD STATE LINE) [Collision, Property Damage][CPD Sub-Type 1] Location: US 50 EAST/WEST AT MP 0 (WASH. DC / MD STATE LINE)	SOC
Incident @ I-95 SOUTH AT 495 SPLIT [Collision, Personal Injury][CPI Sub-Type 1] Location: I-95 SOUTH AT 495 SPLIT	SOC
Incident @ I-95 SOUTH AT 495 SPLIT [Disabled In Roadway][DISIR Sub-Type 1] Location: I-95 SOUTH AT 495 SPLIT	SOC

Figure 4-79. Incident Sub-Types: Sub-Type On Home Page Events Tab

4.7.14 Used By Devices List / Detail Pages

For a user with appropriate rights, an incident sub-type assigned to an event is also viewable within the event name on the Device Details pages for any devices used by that event. **Note:** The DMS Details page is displayed below as example of a device used by a traffic event response plan. A similar display of the incident sub-type will occur on device detail pages for HAR, Camera, and On/Off Devices for any of these devices used by an event.

DMS: 4408
 I-695 I/L (East), past Ex. 21 Park Hgts Ave.

Message
 Message (Text): RIGHT LANE BLOCKED CAUTION AHEAD 5MI
 Message (MULTI): [PT2500][JL3]RIGHT LANE BLOCKED[NL][NL][JL3]CAUTION AHEAD 5MI
 Beacons Enabled: false
 Used By: * [Incident @ I-83 SOUTH/NORTH AT MP 6.7 \(BALTO CITY / BALTO COUNTY LINE\) \[Collision, Fatality\]\[CF Sub-Type 1\]](#)

Figure 4-80. Incident Sub-Types: Sub-Type On Used By Device Details Pages

4.7.15 ATMS-649 and ATMS-651: Add Contact extension and multiple email addresses

Contact phone numbers gain an optional extension number and the ability to hold multiple email addresses.

Contacts and Event Participants (both the Contact type and the Resource type) now provide for an optional phone number extension. This phone extension appears in many contexts as seen below.

The user interface design of the multiple email addresses parallels the existing implementation of multiple phone numbers. Attributes of emails addresses include the type (work, home, other) and an indication if a given email address should be used when the contact is automatically notified. Multiple email addresses within a contact may share the same email type. Any number of email addresses within a contact can have the notification indication.

Phone Numbers (Priority Order):

Type	Number	Extension	
--- Select ---		23	Down Clear
--- Select ---	555-123-4567		Down Up Clear
Home			Down Up Clear
Work	555-444-3333		Down Up Clear
Other	666-777-8888	34	Up Clear

[Add](#)

Emails (Priority Order):

Notify	Type	Address	
<input type="checkbox"/>	--- Select ---		Clear

[Add](#)

Figure 4-81. Add / Edit Contact Phone Extension and Multiple Email Addresses

Contacts (2 of 663) [Set Columns](#) [show default columns](#)

Filters: Op Centers: SOC [View All](#)

[Add Contact](#) [Print...](#) [Export PDF](#) [Export CSV](#)

Search Contacts: [Clear](#)

Last Name	First Name	Agency	Username	Phone Numbers	Email Addresses	Call Sign	Updated	Actions
Smith	John	--Any--	--Any--	444-555-6666 x234 (Work) 444-555-6666 x56 (Work) 111-222-3333 (Home) 888-777-6666 (Home) 123-456-7890 x4 (Other) 454-656-4532 (Fax)	work1@xyz.net (Work*) home1@abc.com (Home)		18:54	Edit Remove
Smith	Mike			555-123-4567 (Work) 555-987-6543 (Home)	work1@p.q (Work*)		03/22/16	Edit Remove

Figure 4-82. View the Contact List

Contacts (2 of 663) [Set Columns](#)

Filters: Location: I-83 NORTH AT BELFAST RD [View All](#)

Search Contacts: [Clear](#)

	Last Name	First Name	Agency	Username	Op Center(s)	Call Sign	Office / Shop	Phone Numbers	Do Not Contact	Email Addresses	Title
<input checked="" type="checkbox"/>	Smith	John	--Any--		SOC			<input type="radio"/> 444-555-6666 x234 (Work) <input checked="" type="radio"/> 444-555-6666 x56 (Work) <input type="radio"/> 111-222-3333 (Home) <input type="radio"/> 888-777-6666 (Home) <input type="radio"/> 123-456-7890 x4 (Other) <input type="radio"/> 454-656-4532 (Fax)		work1@xyz.net (Work*) home1@abc.com (Home)	
<input type="checkbox"/>	Smith	Mike			SOC			555-123-4567 (Work) 555-987-6543 (Home)		work1@p.q (Work*)	

Figure 4-83. Select Stand-alone Contact Participant

Participation [Add Resource / Type](#) [Add Contact](#)

☒ AVL Auto Detection Enabled (In the table below, 'A' indicates auto detection of on scene arrival/departure and 'M' indicates manual operation.)

Participant	Category	Notified	Arrived / Responded	Departed
Smith, John Phone: 444-555-6666 x234 (Work)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CHART Unit 9300 Contact: Smith, John X Phone: 444-555-6666 x56 (Work)	CHART Unit	<input type="checkbox"/>	<input type="checkbox"/> M	<input type="checkbox"/> M

Figure 4-84. Event Details Participation Panel

Participation [Add Resource / Type](#)

☒ AVL Auto Detection Enabled (In the table below, 'A' indicates auto detection of on scene arrival/departure and 'M' indicates manual operation.)

Participant
Smith, John Phone: 444-555-6666 x234 (Work) Contact's Call: X
CHART Unit 9300 Contact: Smith, John X Phone: 444-555-6666 x56 (Work) Contact's Call: X

Smith, John [Edit](#)

Office/Shop: Candelwood

Phone Numbers: 444-555-6666 x234 (Work) [De-Select](#)
 444-555-6666 x56 (Work) [Select](#)
 111-222-3333 (Home) [Select](#)
 888-777-6666 (Home) [Select](#)
 123-456-7890 x4 (Other) [Select](#)
 454-656-4532 (Fax) [Select](#)

Call Sign: 1234

Emails: [work1@xyz.net](#) (Work*)
[home1@abc.com](#) (Home)

Devices With

Response [A](#)

Figure 4-85. Event Details Stand-alone Contact Participation Popup

Participation [Add Resource / Type](#)

☒ AVL Auto Detection Enabled (In the table below, 'A' indicates auto detection of on scene arrival/departure)

Participant
Smith, John Phone: 444-555-6666 x234 (Work) Contact's Call Sign: 1234
CHART Unit 9300 Contact: Smith, John Phone: 444-555-6666 Contact's Call Sign: 12

Smith, John [Edit](#)

Office/Shop: Candelwood

Phone Numbers: 444-555-6666 x234 (Work) [Select](#)
 444-555-6666 x56 (Work) [De-Select](#)
 111-222-3333 (Home) [Select](#)
 888-777-6666 (Home) [Select](#)
 123-456-7890 x4 (Other) [Select](#)
 454-656-4532 (Fax) [Select](#)

Call Sign: 1234

Emails: [work1@xyz.net](#) (Work*)
[home1@abc.com](#) (Home)

Devices Within 3

Response [Add Item](#)

8 Monitors
[Show Monitors](#)

Figure 4-86. Event Details Stand-alone Resource-or-type Participation Popup

Open Traffic Events (12) [Set Columns](#) [\(show default columns\)](#)

☐ Hide Devices

Route	Direction	Event Type ^Δ	Op Center	County / State	Lane Closures
Any--	--Any--	--Any--	--Any--	--Any--	--Any--
33	North	Incident (Other) edit incident data	SOC participants (2)	Baltimore County, MD	
nactive ECUTED	Msg Inactive NOT EXECUTED				
99	898				
270	North	Incident (Other) edit incident data	SOC participants (0)		
nactive ECUTED					
117					

Participants

☒ Resource/Type ☐ Contact [Add](#)

Description	Notified	Arrived / Responded	Departed
Smith, John more info Phone Number: 444-555-6666 x234 (Work) Emails: work1@xyz.net (Work*) home1@abc.com (Home)	<input checked="" type="checkbox"/>	<input type="checkbox"/> M <input type="checkbox"/> M	<input type="checkbox"/> M <input type="checkbox"/> M
CHART Unit 9300 Contact: Smith, John more info Phone Number: 444-555-6666 x56 (Work) Emails: work1@xyz.net (Work*) home1@abc.com (Home)	<input checked="" type="checkbox"/>	<input type="checkbox"/> M <input type="checkbox"/> M	<input type="checkbox"/> M <input type="checkbox"/> M

'M' = manual, 'A' = auto mode

Figure 4-87. Event List Participation Popup

Choose Contact for CHART Unit 9300 (Incident @ I-83 NORTH AT BELFAST RD [Other]) (1)

[Set Columns](#) [\(show default columns\)](#)

Filters: Location: I-83 NORTH AT BELFAST RD [View All](#)

	Name / Agency	Username	Op Center(s) --Any-- ▾	Call Sign	Office / Shop --Any-- ▾	Phone Numbers	Do Not Contact	Title
Select	1. Smith, John		SOC			Select 444-555-6666 x234 (Work) Select 444-555-6666 x56 (Work) Select 111-222-3333 (Home) Select 888-777-6666 (Home) Select 123-456-7890 x4 (Other) Select 454-656-4532 (Fax)		

Cancel

Figure 4-88. Select Contact for Association with Resource Type Participation

Last of chapter 4

5 Acronyms/Glossary

Error! Reference source not found.defines acronyms and other terms used in this document.

Table 5-1. Acronyms & Glossary

TERM	DESCRIPTION
AJAX	Asynchronous Javascript and XML
AOR	Area of Responsibility representing an area that a person, user, operations center, etc. is responsible for.
API	Application Programming Interface
ATMS	Advance Traffic Management System
CHART	Coordinated Highways Action Response Team
CORBA	Common Object Request Broker Architecture
CCTV	Closed Circuit Television
COTS	Commercial Off The Shelf [software or equipment]
CRUD	Create, Read, Update, and Delete (the four standard actions which can be performed on a database table).
DBMS	Database Management System
DMS	Dynamic Message Sign. An electronic sign used to display information to the traveling public.
DTMF	Dual Tone Multi-Frequency (touchtone telephone signaling system)
Dynamic Message Sign	An electronic sign used to provide messages to motorists.
ERD	Entity Relationship Diagram, used to show the relationship between tables in an RDBMS
FMS	Field Management System
Functional Right	A user right, granted to CHART users via Roles. Each operation on a device, including the ability to configure a device, view its sensitive information, and issue commands to the device are controlled by user rights. Users must possess the proper right to be able to perform these actions.
GB	Gigabytes
GIF	Graphic Interchange Format (picture file)
GIS	A Geographic Information System (GIS) is any system that captures, stores, analyzes, manages, and presents data that are linked to location
GUI	Graphical User Interface
HAR	Highway Advisory Radio. A radio station used to broadcast programmable messages to motorists and other travelers regarding traffic and other delays.
HTML	HyperText Markup Language
HTTP	HyperText Transfer Protocol
IDL	Interface Definition Language. Describes a CORBA interface.
JAXB	Java API for XML Binding
JDBC	Java Database Connectivity
JDOM	Java Document Object Model
JNI	Java Native Interface, a means of interfacing Java programs with languages written in other languages, such as C++
JRE	Java Runtime Environment
JTS	Java Topology Suite
KB	Kilobytes

TERM	DESCRIPTION
LCP	Lane Closure Permit, a permit for closure of a road for maintenance, or the system used to manage those permits.
MB	Megabytes
MSSQL	Microsoft SQL [Server], the DBMS used in CHART.
NSIS	Nullsoft Scriptable Installation System
PDF	Portable Document Format
PR	Problem Report
RDBMS	Relational DBMS
REST	Representational State Transfer
RPC	Remote Procedure Call
RV	Recreational Vehicle
SDK	Software Development Kit
SFS	Streaming Flash Server
SHA	State Highway Administration
SNMP	Simple Network Management Protocol
SOC	Statewide Operations Center
SQL	Structured Query Language
TSS	Traffic Sensor System
UCD	Use Case Diagram. Depicts a collection of Use Cases.
UML	Unified Modeling Language
XML	Extensible Markup Language

6 Mapping to Requirements

Error! Reference source not found.shows how the new and modified requirements in the CHART R16 Requirements document map to design elements contained in this design.

Table 6-1. Mapping to Requirements

Tag	Content	Features	Use Case	Other Design Elements
SR1.1.8.1.1.6.3.1	The available directions shall include: None, North, South, East, West, Inner Loop, Outer Loop, North/South, East/West and Inner Loop/Outer Loop. (Modified from South/North for R16).	Task104 PRs	Set Object Location	
SR1.1.8.1.1.9.1.2	The system shall display the range of known state milepost values for reference when the user specifies a state milepost, if the range of mileposts is known.	Task104 PRs	Set Object Location	NONE
SR1.1.8.1.1.9.2.2	The system shall display the range of known county milepost values for reference when the user specifies a county milepost, if the range of mileposts is known.	Task104 PRs	Set Object Location	NONE
SR1.4.2.3.5.5.2	The system shall show the vehicles involved for each incident if specified for the incident.	RV veh type	N/A (wording correction only)	
SR1.4.2.11.3.9	The system shall display the vehicles involved for an Incident displayed in the Operations Center Report.	RV veh type	View Operations Center Report	Prototype only
SR1.5.2.1.4.23.45	The system shall allow the user to specify the device commissioned date for a DMS.	Dev cmsn date	Add DMS, Copy DMS, Edit DMS Configuration, View DMS Configuration	Chart2DMSControlIDLClasses CD
SR1.5.2.1.4.23.46	The system shall allow the user to specify whether the Export Managed DMS right is required to export the DMS.	Task104 PRs	Add DMS, Copy DMS, Edit DMS Configuration, View DMS Configuration	Chart2DMSControlIDLClasses CD

Tag	Content	Features	Use Case	Other Design Elements
SR1.5.2.1.8.21	The system shall allow the user to specify the device commissioned date for a HAR.	Dev cmsn date	Add HAR, Copy HAR, Edit HAR Configuration, View HAR Configuration	HARControlIDLClasses CD
SR1.5.2.1.8.22	The system shall allow the user to specify whether the Export Managed HAR right is required to export the HAR.	Task104 PRs	Add HAR, Copy HAR, Edit HAR Configuration, View HAR Configuration	HARControlIDLClasses CD
SR1.5.2.1.9.11.14	The system shall allow the user to specify the device commissioned date for a SHAZAM.	Dev cmsn date	Add SHAZAM, Copy SHAZAM, Edit SHAZAM Configuration, View SHAZAM Configuration	HARNotificationIDLClasses CD
SR1.5.2.1.9.11.15	The system shall allow the user to specify whether the Export Managed SHAZAM right is required to export the SHAZAM.	Task104 PRs	Add SHAZAM, Copy SHAZAM, Edit SHAZAM Configuration, View SHAZAM Configuration	HARNotificationIDLClasses CD
SR1.5.2.1.17.13.19	The system shall allow the user to specify the device commissioned date for a TSS.	Dev cmsn date	Add TSS, Copy TSS, Edit TSS Configuration, View TSS Configuration	TSSManagementIDLClasses CD
SR1.5.2.1.17.13.20	The system shall allow the user to specify whether the Export Managed TSS right is required to export the TSS.	Task104 PRs	Add TSS, Copy TSS, Edit TSS Configuration, View TSS Configuration	TSSManagementIDLClasses CD
SR1.5.2.1.18.8.12.10	The system shall allow the user to specify a zone (Public, Internal, SWIGI or MVIEW) for a streaming flash server. (The zone will be used by Data Exporter consumers).	CCTV export	Specify Zone for SFS	
SR1.5.2.1.18.9.13	The system shall allow the user to specify the device commissioned date for a camera.	Dev cmsn date	Add Camera, Copy Camera, Edit Camera Configuration, View Camera Configuration	CameraControlIDLClasses CD

Tag	Content	Features	Use Case	Other Design Elements
SR1.5.2.1.18.9.14	The system shall allow the user to specify whether the Export Managed Camera right is required to export the Camera.	CCTV export	Specify Camera Managed Export Flag	
SR1.5.2.1.18.9.15	The system shall allow the user to specify 0, 1 or more pre-defined categories for a camera (A camera's category(s) are exported to Data Exporter consumers and can be used for grouping / filtering).	CCTV export	Specify Categories For A Camera	
SR1.5.2.1.19.1.15	The system shall allow the user to specify the device commissioned date for a monitor.	Dev cmsn date	Add Monitor, Copy Monitor, Edit Monitor Configuration, View Monitor Configuration	MonitorControlIDLClasses CD
SR1.5.2.1.25.4.12	The system shall allow the user to specify the device commissioned date for an On/Off Device.	Dev cmsn date	Add On/Off Device, Copy On/Off Device, Edit On/Off Device Configuration, View On/Off Device Configuration	OnOffDeviceControlIDLClasses CD
SR1.5.2.1.19.1.15	The system shall allow the user to specify the device commissioned date for a monitor.	Dev cmsn date	Add Monitor, Copy Monitor, Edit Monitor Configuration, View Monitor Configuration	MonitorControlIDLClasses CD
SR1.5.2.1.25.4.12	The system shall allow the user to specify the device commissioned date for an On/Off Device.	Dev cmsn date	Add On/Off Device, Copy On/Off Device, Edit On/Off Device Configuration, View On/Off Device Configuration	OnOffDeviceControlIDLClasses CD
SR1.5.5.1.1.16	The detailed data displayed for a DMS shall include the Commissioned Date, if specified.	Dev cmsn date	View DMS List	
SR1.5.5.1.1.16.1	The Commissioned Date for a DMS within the list shall be hidden by default.	Dev cmsn date	View DMS List	

Tag	Content	Features	Use Case	Other Design Elements
SR1.5.5.1.1.17	The detailed data displayed for a DMS shall include the flag that indicates whether the Export Managed DMS right is required to export the DMS.	Task104 PRs	View DMS List	
SR1.5.5.1.1.17.1	The flag that indicates whether the Export Managed DMS right is required to export a DMS within the list shall be hidden by default.	Task104 PRs	View DMS List	
SR1.5.5.1.2.16	The system shall allow the user to sort the list of DMSs by Commissioned Date.	Dev cmsn date	View DMS List	
SR1.5.5.1.2.17	The system shall allow the user to sort the list of DMSs by the flag that indicates if the Export Managed DMS right is required to export the DMS.	Task104 PRs	View DMS List	
SR1.5.5.1.3.15	The system shall allow the user to filter the list of DMSs by Commissioned Date.	Dev cmsn date	View DMS List	
SR1.5.5.1.3.16	The system shall allow the user to filter the list of DMSs by the flag that indicates if the Export Managed DMS right is required to export the DMS.	Task104 PRs	View DMS List	
SR1.5.5.2.1.14	The detailed data displayed for a HAR shall include the Commissioned Date, if specified.	Dev cmsn date	View HAR List	
SR1.5.5.2.1.14.1	The Commissioned Date for a HAR within the list shall be hidden by default.	Dev cmsn date	View HAR List	
SR1.5.5.2.1.15	The detailed data displayed for a HAR shall include the flag that indicates whether the Export Managed HAR right is required to export the HAR.	Task104 PRs	View HAR List	
SR1.5.5.2.1.15.1	The flag that indicates whether the Export Managed HAR right is required to export a HAR within the list shall be hidden by default.	Task104 PRs	View HAR List	
SR1.5.5.2.2.15	The system shall allow the user to sort the list of HARs by Commissioned Date.	Dev cmsn date	View HAR List	
SR1.5.5.2.2.16	The system shall allow the user to sort the list of HARs by the flag that indicates if the Export Managed HAR right is required to export the HAR.	Task104 PRs	View HAR List	
SR1.5.5.2.3.14	The system shall allow the user to filter the list of HARs by Commissioned Date.	Dev cmsn date	View HAR List	

Tag	Content	Features	Use Case	Other Design Elements
SR1.5.5.2.3.15	The system shall allow the user to filter the list of HARs by the flag that indicates if the Export Managed HAR right is required to export the HAR.	Task104 PRs	View HAR List	
SR1.5.5.3.1.14	The detailed data displayed for a SHAZAM shall include the Commissioned Date, if specified.	Dev cmsn date	View SHAZAM List	
SR1.5.5.3.1.14.1	The Commissioned Date for a SHAZAM within the list shall be hidden by default.	Dev cmsn date	View SHAZAM List	
SR1.5.5.3.1.15	The detailed data displayed for a SHAZAM shall include the flag that indicates whether the Export Managed SHAZAM right is required to export the SHAZAM.	Task104 PRs	View SHAZAM List	
SR1.5.5.3.1.15.1	The flag that indicates whether the Export Managed SHAZAM right is required to export a SHAZAM within the list shall be hidden by default.	Task104 PRs	View SHAZAM List	
SR1.5.5.3.2.15	The system shall allow the user to sort the list of SHAZAMs by Commissioned Date.	Dev cmsn date	View SHAZAM List	
SR1.5.5.3.2.16	The system shall allow the user to sort the list of SHAZAMs by the flag that indicates if the Export Managed SHAZAM right is required to export the SHAZAM.	Task104 PRs	View SHAZAM List	
SR1.5.5.3.3.9	The system shall allow the user to filter the list of SHAZAMs by Commissioned Date.	Dev cmsn date	View SHAZAM List	
SR1.5.5.3.3.10	The system shall allow the user to filter the list of SHAZAMs by the flag that indicates if the Export Managed SHAZAM right is required to export the SHAZAM.	Task104 PRs	View SHAZAM List	
SR1.5.5.4.1.15	The detailed data displayed for a Detector shall include the Commissioned Date, if specified.	Dev cmsn date	View TSS List	
SR1.5.5.4.1.15.1	The Commissioned Date for a Detector within the list shall be hidden by default.	Dev cmsn date	View TSS List	
SR1.5.5.4.1.16	The detailed data displayed for a Detector shall include the flag that indicates whether the Export Managed TSS right is required to export the detector.	Task104 PRs	View TSS List	

Tag	Content	Features	Use Case	Other Design Elements
SR1.5.5.4.1.16.1	The flag that indicates whether the Export Managed TSS right is required to export a Detector within the list shall be hidden by default.	Task104 PRs	View TSS List	
SR1.5.5.4.2.15	The system shall allow the user to sort the list of Detectors by Commissioned Date.	Dev cmsn date	View TSS List	
SR1.5.5.4.2.16	The system shall allow the user to sort the list of Detectors by the flag that indicates if the Export Managed TSS right is required to export the detector.	Task104 PRs	View TSS List	
SR1.5.5.4.3.13	The system shall allow the user to filter the list of Detectors by Commissioned Date.	Dev cmsn date	View TSS List	
SR1.5.5.4.3.14	The system shall allow the user to filter the list of Detectors by the flag that indicates if the Export Managed TSS right is required to export the detector.	Task104 PRs	View TSS List	
SR1.5.5.5.1.14	The detailed data displayed for a Camera shall include the Commissioned Date, if specified.	Dev cmsn date	View Camera List	
SR1.5.5.5.1.14.1	The Commissioned Date for a Camera within the list shall be hidden by default.	Dev cmsn date	View Camera List	
SR1.5.5.5.1.15	The detailed data displayed for a Camera shall include the flag that indicates whether the Export Managed Camera right is required to export the Camera.	CCTV export	View Camera List	
SR1.5.5.5.1.15.1	The flag that indicates whether the Export Managed Camera right is required to export a Camera within the list shall be hidden by default.	CCTV export	View Camera List	
SR1.5.5.5.1.16	The detailed data displayed for a Camera shall include the Camera Categories, if specified.	CCTV export	View Camera List	
SR1.5.5.5.1.16.1	The Categories for a Camera within the list shall be hidden by default.	CCTV export	View Camera List	
SR1.5.5.5.2.12	The system shall allow the user to sort the list of Cameras by Commissioned Date.	Dev cmsn date	View Camera List	
SR1.5.5.5.2.13	The system shall allow the user to sort the list of Cameras by the flag that indicates if the Export Managed Camera right is required to export the Camera.	CCTV export	View Camera List	

Tag	Content	Features	Use Case	Other Design Elements
SR1.5.5.5.2.14	The system shall allow the user to sort the list of Cameras by Category.	CCTV export	View Camera List	
SR1.5.5.5.3.9	The system shall allow the user to filter the list of Cameras by Commissioned Date.	Dev cmsn date	View Camera List	
SR1.5.5.5.3.10	The system shall allow the user to filter the list of Cameras by the flag that indicates if the Export Managed Camera right is required to export the Camera.	CCTV export	View Camera List	
SR1.5.5.5.3.11	The system shall allow the user to filter the list of Cameras by Category.	CCTV export	View Camera List	
SR1.5.5.6.1.8	The detailed data displayed for a Monitor shall include the Commissioned Date, if specified.	Dev cmsn date	View Monitor List	
SR1.5.5.6.1.8.1	The Commissioned Date for a Monitor within the list shall be hidden by default.	Dev cmsn date	View Monitor List	
SR1.5.5.6.2.8	The system shall allow the user to sort the list of Monitors by Commissioned Date.	Dev cmsn date	View Monitor List	
SR1.5.5.6.3.7	The system shall allow the user to filter the list of Monitors by Commissioned Date.	Dev cmsn date	View Monitor List	
SR1.5.5.14.1	The system shall allow the user to view the following detailed information for each On/Off device that exists in the system: Description, Location, Device Type, Model, Device State (commanded), Device State (actual), Status, Last Update, Route, Direction, County, Connection Site, Owning Organization, Maintaining Organization, State Mile Post, Commissioned Date, and Show on Map Indicator.	Dev cmsn date	View On/Off Device List	
SR1.5.5.14.1.4	The following details in the On/Off device list shall be hidden by default: Device Type, Model, Device State (commanded), Connection Site, Owning Organization, Maintaining Organization, State Mile Post, Commissioned Date, and Show on Map Indicator.	Dev cmsn date	View On/Off Device List	

Tag	Content	Features	Use Case	Other Design Elements
SR1.5.5.14.2	The system shall allow the user to sort the On/Off device list by any of the following: Description, Location, Device Type, Model, Device State (commanded), Device State (actual), Status, Last Update, Route, Direction, County, Connection Site, Owning Organization, Maintaining Organization, State Mile Post, Commissioned Date, and Show on Map Indicator.	Dev cmsn date	View On/Off Device List	
SR1.5.5.14.3	The system shall allow the user to filter the On/Off device list by any of the following: Device Type, Model, Device State (commanded), Device State (actual), Status, Route, Direction, County, Connection Site, Owning Organization, Maintaining Organization, Commissioned Date, and Show on Map Indicator.	Dev cmsn date	View On/Off Device List	
SR1.5.7.3.18.8	The system shall show the zone (Public, Internal, SWIGI or MVIEW) for the Streaming Flash Server.	CCTV export	View Camera Details	
SR1.5.7.3.20	The system shall show a camera's categories if any are specified.	CCTV export	View Camera Details	
SR1.5.7.3.21	The system shall indicate if the Export Managed Camera right is required to export the Camera.	CCTV export	View Camera Details	
SR1.6.1.6.1	The system shall allow a user to search the Contact List to display contacts containing search text in any of the following fields: Last Name, First Name, Agency, any Email Address, ATMS Username, or Call Sign. (Modified in R16 for multiple email addresses)	Task104 PRs	Search Contact List	
SR1.6.1.6.14	The system shall allow a user viewing the Contact List to view the following information for each contact: Last Name, First Name, Agency, ATMS Username, Op Centers, Phone Numbers, Do Not Contact Schedule, Email Addresses, Call Sign, Title, Office / Shop, Notify Via Email flag, Notification Groups, Resource Assignable flag, Call Lists, Additional AORs, Memo, Business Address, Last Updated Time. (Modified in R16 for multiple email addresses)	Task104 PRs	View Contact List	

Tag	Content	Features	Use Case	Other Design Elements
SR1.6.1.6.14.1	The system shall show the following information in the Contact List by default: Last Name, First Name, Agency, ATMS Username, Op Centers, Phone Numbers, Do Not Contact Schedule, Email Addresses, Call Sign, Title, and Office / Shop. (Modified in R16 for multiple email addresses)	Task104 PRs	View Contact List	
SR1.6.1.6.14.2	The system shall allow the user to show or hide the following information in the Contact List: ATMS Username, Op Centers, Phone Numbers, Do Not Contact Schedule, Email Addresses, Call Sign, Title, Office / Shop, Notify Via Email flag, Notification Groups, Resource Assignable flag, Call Lists, Additional AORs, Memo, Business Address, and Last Updated Time. (Modified in R16 for multiple email addresses)	Task104 PRs	View Contact List	
SR1.6.1.8.10.4	The system shall allow an optional extension to be supplied along with each phone number.	Task104 PRs	Specify Contact Information	
SR1.6.1.8.11	The system shall allow a user with the Configure Contacts or Configure Contact Email right to indicate if an email address can be used for notification. (Modified for R16 for multiple email addresses)	Task104 PRs	Specify Contact Information	
SR1.6.1.8.12	The system shall allow a user with the Configure Contacts or Configure Contact Email right to indicate Email Addresses for a contact.(Modified for R16 for multiple email addresses)	Task104 PRs	Specify Contact Information	
SR1.6.1.8.12.1	The system shall allow a user with the Configure Contacts or Configure Contact Email right to indicate if an Email Address is to be used for Notification. (Modified for R16 for multiple email addresses)	Task104 PRs	Specify Contact Information	
SR1.6.2.1.2.1	The system shall allow the user to add a contact to a new notification group only if the contact has at least one email address marked for notification use. (Modified for R16 for multiple email addresses).	Task104 PRs	Add Notification Group	NotificationMgmtReqHdlr.getAddEditNotificationGroupForm SD

Tag	Content	Features	Use Case	Other Design Elements
SR1.6.2.2.2.1	The system shall allow the user to add a contact to an existing notification group only if the contact has an email address marked for notification use. (Modified for R16 for multiple email addresses)	Task104 PRs	Edit Notification Group	NotificationMgmtReqHdlr.getAddEditNotificationGroupForm SD
SR1.6.4.6.2.1	The system shall allow the user to view the details of a contact in an individual call list when viewing the list of call lists.	Callout list	View Call List List	Prototype only
SR3.5.1.2.1.2	The system shall allow an individual Contact to be specified as a recipient when sending a notification only if it has an email address marked for notification use. (Modified for R16 for multiple email addresses)	Task104 PRs	Send Notification	NotificationReqHdlr.getContactsEligibleForNotificationJSON SD
SR3.5.1.2.1.3	The system shall send a notification to an individual contact only if it has at least one email address marked for notification use. (Modified for R16 for multiple email addresses).	Task104 PRs	Send Notification	NotificationManagerImpl.sendNotification SD
SR3.5.1.2.2.2	The system shall send a notification to a contact contained in a specified notification group only if it has at least one email address marked for notification use. (Modified for R16 for multiple email addresses).	Task104 PRs	Send Notification	NotificationManagerImpl.sendNotification SD
SR4.2.2.4.1.4	The system shall allow the user to invoke the details page for the selected weather station within the Lufft Web user interface, if the Lufft Web user interface is accessible from the user's browser. [Modified for R16. Formerly referenced the SCAN instead of the Lufft system.]	Lufft I/F	Display Weather Station Conditions	Prototype / JAD, ServletBaseClasses CD
SR4.2.2.7.4.4	The system shall allow a user with the Manage Events and View Sensitive Traffic information rights to select a single incident sub-type from the defined sub-types when editing the incident attributes of any open or pending incident event.	Inc subtypes	Traffic Event Management Incident SubTypes	TrafficEventManagerIDLClasses IDL, servlet.trafficEvents CD
SR4.2.2.7.4.4.1	Upon modifying the incident type for an open or pending incident event, the system shall refresh the corresponding selectable list of sub-types displayed (see SR4.2.2.7.9).	Inc subtypes	Traffic Event Management Incident SubTypes	servlet.trafficEvents CD

Tag	Content	Features	Use Case	Other Design Elements
SR4.2.2.7.4.5	The system shall allow a user with the Manage Events and View Sensitive Traffic information rights to edit the incident sub-type, specifying a different selection from the list of applicable sub-types.	Inc subtypes	Traffic Event Management Incident SubTypes	TrafficEventManagementIDLClasses IDL, servlet.trafficEvents CD
SR4.2.2.7.4.6	The incident sub-type text shall be visible in the event details and in the event name on all ATMS pages for any open, pending, or closed incident event.	Inc subtypes	Traffic Event Management Incident SubTypes	servlet.trafficEvents CD
SR4.2.2.7.4.6.1	The system shall display the selected sub-type within the event name as appended text following the incident type text.	Inc subtypes	Traffic Event Management Incident SubTypes	servlet.trafficEvents CD
SR4.2.2.7.4.7	The system shall allow a user with the Manage Events and View Sensitive Traffic information rights to clear the existing sub-type selection of any open or pending incident event.	Inc subtypes	Traffic Event Management Incident SubTypes	TrafficEventManagementIDLClasses IDL, servlet.trafficEvents CD
SR4.2.2.7.4.7.1	Upon clearing an existing sub-type from an incident, the event name and event details shall be updated to clear the sub-type text on all ATMS pages for the incident event.	Inc subtypes	Traffic Event Management Incident SubTypes	servlet.trafficEvents CD
SR4.2.2.7.4.8	The system shall log an entry in the traffic event history log when a user updates the incident sub-type within the event name.	Inc subtypes	Traffic Event Management Incident SubTypes	TrafficEventManagementIDLClasses IDL, servlet.trafficEvents CD
SR4.2.2.7.4.9	The system shall allow a user with the View Traffic Event Sensitive Details right to search for an incident event using the incident sub-type.	Inc subtypes	Traffic Event Management Incident SubTypes	servlet.trafficEvents CD
SR4.2.2.7.9	The system shall allow a user with the Configure Systems right to create one or more available incident sub-type(s) for each incident type currently in ATMS (see SR4.2.2.7.4.1).	Inc subtypes	Traffic Event Management Incident SubTypes	TrafficEventManagementIDLClasses IDL, servlet.trafficEvents CD
SR4.2.2.7.9.1	The system shall define the incident sub-type as a free-form text description of 100 characters or less.	Inc subtypes	Traffic Event Management Incident SubTypes	TrafficEventManagementIDLClasses IDL, servlet.trafficEvents CD
SR4.2.2.7.10	The system shall allow a user with the Configure Systems right to view the list of available incident sub-types defined for each incident type currently in ATMS (see SR4.2.2.7.4.1).	Inc subtypes	Traffic Event Management Incident SubTypes	servlet.trafficEvents CD

Tag	Content	Features	Use Case	Other Design Elements
SR4.2.2.7.11	The system shall allow the user to edit the text for an incident sub-type without a change to any occurrences in existing or past incident events.	Inc subtypes	Traffic Event Management Incident SubTypes	servlet.trafficEvents CD
SR4.2.2.7.12	The system shall allow a user with the Configure Systems right to remove one or all available incident sub-type(s) from each incident type without a change to any occurrences in existing or past incident events.	Inc subtypes	Traffic Event Management Incident SubTypes	TrafficEventManagerIDLClasses IDL, servlet.trafficEvents CD
SR4.3.1.1.10.1.9.5.6	The system shall show the email addresses as part of the detailed information for a contact participating in a traffic event, if the contact has at least one email address and the user has the View Contact Info right. (Modified for R16 for multiple email addresses)	Task104 PRs	View Participant Contact	
SR4.3.5.14.1.2.2.4	The system shall allow a user with the View Contact Info right to view the phone numbers, do not contact schedule, and email addresses of a contact participating in a traffic event shown in an applicable list.(Modified for R16 for multiple email addresses)	Task 104 PRs	View Participant Contact	
SR10.6.7.10	The system shall allow a user with the Manage Traffic Events user right to view the details of an open Planned Closure event associated with a permit.	LCP Int	View Planned Closure Event Details	NONE
SR14.1	The system shall support Internet Explorer Version 11.	ALL	N/A	N/A

7 Use Case Diagrams

The Use Case Diagrams (UCDs) below depict new and modified functionality for CHART ATMS R16. The use case diagrams exist in the Enterprise Architect design tool in the chartdesign project, under the CHART-ATMS-R16 folder.

7.1 CCTV Enhancements

7.1.1 CCTV Export Enhancements UCD

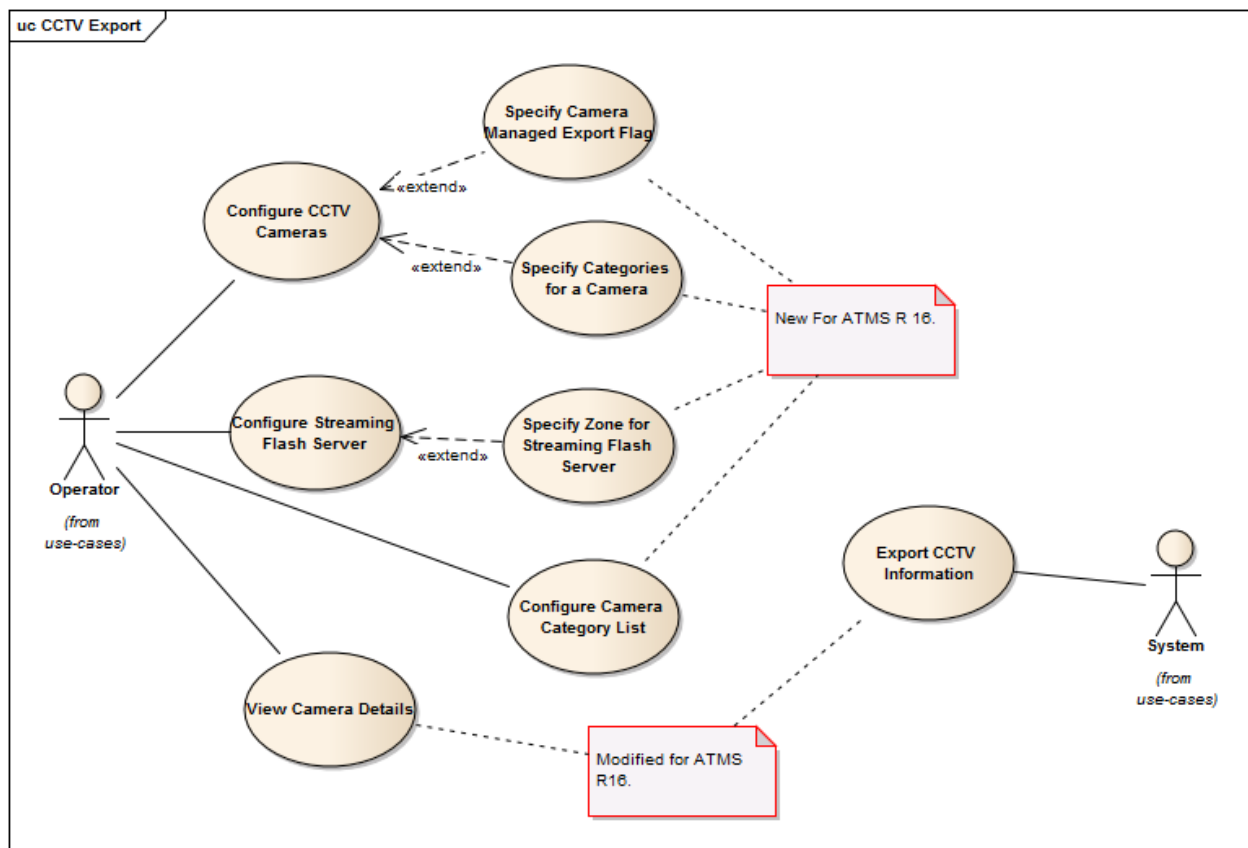


Figure 7-1. CCTV Export Enhancements (UCD)

7.1.1.1 Configure Camera Category List

The system shall allow users with appropriate privilege to configure a system wide list of cameracategories to be used when configuring a camera's optional categories.

7.1.1.2 Configure CCTV Cameras

The system shall allow users to configure CCTV cameras in the system.

7.1.1.3 Configure Streaming Flash Server

The system shall allow users with the appropriate privilege to configure Streaming Flash Servers used in the system.

7.1.1.4 Export CCTV Information

The system shall export CCTV information to External Clients. For ATMS R16 the system shall require that an External Client has Export Managed Camera functional right to receive sensitive cameras in their data feed. . For ATMS R16 the system shall require that an External Client has Export Public SFS Data functional right to receive data for streaming servers in the 'Public' zone during camera export. A specific functional right is also required for 'Internal', 'SWG1' and 'MVIEW' zones as well.

7.1.1.5 Specify Camera Managed Export Flag

The system shall allow a user to specify whether the Export Managed Camera right is require to receive exported information about the camera.

7.1.1.6 Specify Categories for a Camera

The system shall allow a user to specify 0, 1 or more categories for a camera (Camera categories are exported to downstream systems for the purpose of grouping cameras).

7.1.1.7 Specify Zone for Streaming Flash Server

The system shall allow a user to specify a zone for a Streaming Flash Server. Possible values are(Public, Internal, SWGI and MVIEW).

7.1.1.8 View Camera Details

The system shall allow a user to view configuration and status details for a camera. For ATMS R16 user will be able to view a camera's managed export flag, optional categories, and an SFS zone for any configure Streaming Servers for a camera.

7.2 Contact Management

7.2.1 Contact Management UCD

The following diagram shows the contact management use cases, and indicate which apply to the changes being made for CHART ATMS R16. Only the four use cases marked as updated for R16 are described below the figure.

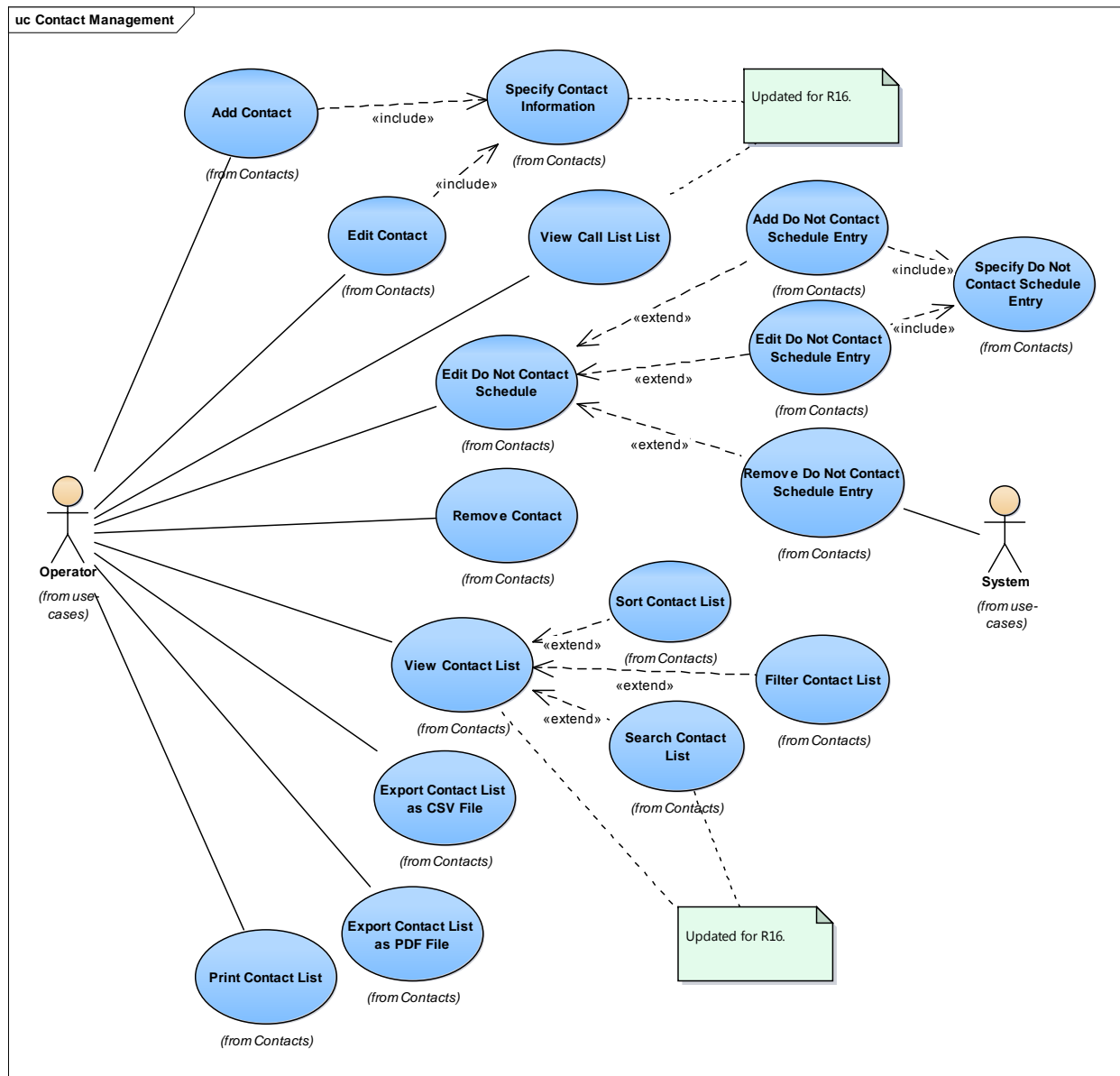


Figure 7-2. Contact Management UCD

7.2.1.1 Search Contact List

The system will allow a user viewing the Contact List to specify search text for searching the list. The system will display only the contacts where the column text contains the search text for the following columns: Last Name, First Name, Agency, Email Addresses, ATMS Username, or Call Sign. The system will reapply the search text after a sort or filter function is performed in the Contact List.

7.2.1.2 Specify Contact Information

The information pertaining to a contact can be set when adding or editing a contact. In R16 this functionality is changed to allow multiple e-mail addresses to be specified for a contact, along

with an indicator for each to specify if the e-mail address is to be used for notification. Also, as part of ATMS-536, the e-mail validation is made more strict to prevent e-mail addresses that contain two consecutive dots (periods) which was the cause of a notification issue previously. Also in R16, phone numbers are changed to allow an extension to be included.

7.2.1.3 View Contact List

The system will allow a user with the View Contact Info right to view the Contact List.

The system will allow the user to view the following information: Last Name, First Name, Agency, ATMS Username, Op Centers, Phone Numbers, Do Not Contact Schedule, Email Addresses, Notify Via Email flags, Call Sign, Title, Office / Shop, Notification Groups, Call Lists, Additional AORs, Memo, Business Address, and Last Updated Time. The system will show the following information by default: Last Name, First Name, Agency, ATMS Username, Op Centers, Phone Numbers, Do Not Contact Schedule, Email Addresses, Call Sign, Title, and Office / Shop.

The system will allow the user to show or hide the following information: ATMS Username, Op Centers, Phone Numbers, Do Not Contact Schedule, Email Addresses, Call Sign, Title, Office / Shop, Notify Via Email flags, Notification Groups, Call Lists, Additional AORs, Memo, Business Address, Last Updated Time. The system will allow the user to view the default set of columns, if the current set of columns displayed differs from the default. The system will save the column visibility and will apply it the next time the user views the list (even after logging out).

The system will indicate if a contact's ATMS username does not match any known ATMS user in the system, if displaying the ATMS Username in the Contact List. The system will indicate if a contact's Do Not Contact schedule includes the current time, if displaying Phone Numbers in the Contact List.

7.2.1.4 View Call List

The system will allow a user with the View Contact Info right to view the list of call lists. The system will display the following information for each call list in the list of call lists: Name (event resource or type name), Type (event resource type description), Category (event resource type category), and the Number of Contacts in the call list. The system will allow the user to view the names and/or agencies of the contacts in an individual call list when viewing the list of call lists. Starting in R16, each contact or agency shown in an individual call list provides the ability to view the details of that contact or agency in a popup by clicking on the name or the contact or agency.

7.2.2 Notification Management UCD

This diagram shows notification management use cases (contact usage) that are being changed for R16.

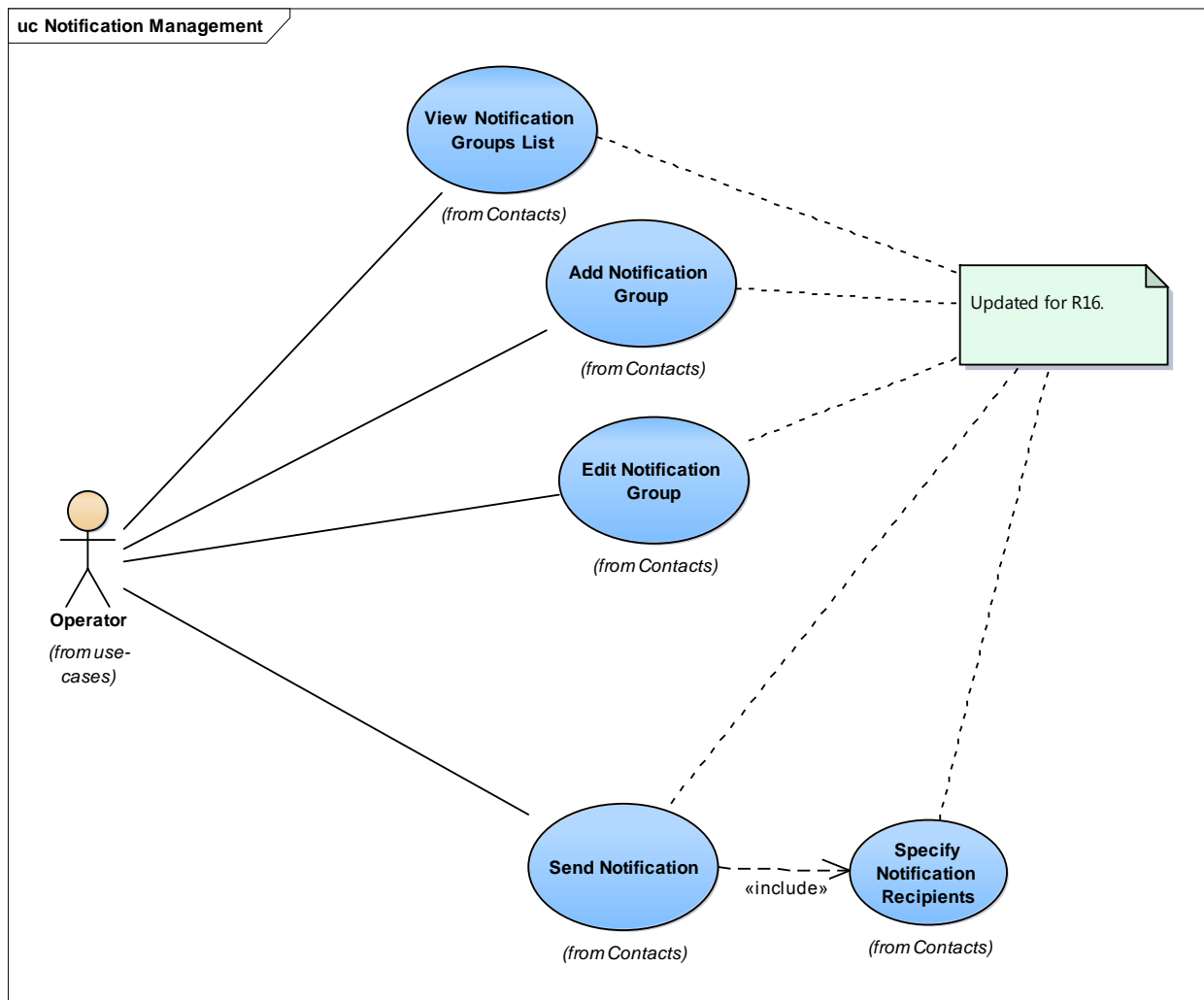


Figure 7-3. Notification Management UCD

7.2.2.1 Add Notification Group

The system will allow a user with the Configure Notification Groups right to create a notification group. The system will require the user to specify a name for the new notification group. The system will allow a user to specify the contacts that belong in the notification group. New for R16: The system will allow the user to add a contact to a new notification group only if the contact has at least one email address specified with its Notify via Email flag set to true.

7.2.2.2 Edit Notification Group

The system will allow a user with the Configure Notification Groups or Configure Notification Group And Contact Associations right to invoke the form for editing a notification group. The system will allow a user with the Configure Notification Groups right to change the name of the notification group. The system will allow a user with the Configure Notification Groups right or the Configure Notification Group and Contact Associations right to configure the notification group's contacts. New for R16: The system will allow the user to add a contact to an existing

notification group only if the contact has at least one email address specified with its Notify via Email flag set to true.

7.2.2.3 Send Notification

The system will allow a user with the Send Notifications right to send a notification. New for R16: The system will send a notification to a contact (either contained in the notification group or specified as an individual) only if it has at least one email address with its Notify via Email flag set to true.

7.2.2.4 Specify Notification Recipients

The system will allow the user to specify notification recipients. The system will allow the user to specify any combination of notification groups and individual contacts. The system will allow the user to search for individual contacts and notification groups. New for R16: The system will allow an individual Contact to be specified as a recipient when sending a notification only if it has at least one email address with its Notify via Email flag set to true.

7.2.2.5 View Notification Groups List

The system will allow a user with the View Notification Recipients right to view the list of Notification Groups. The Notification Groups List will include columns for the Group Name and Contacts. New for R16: Multiple email addresses and phone extensions are added in R16).

7.3 Decision Support

7.3.1 Decision Support UCD

This diagram shows the decision support related changes for R16. All use cases shown on this diagram are existing use cases that are modified for R16.

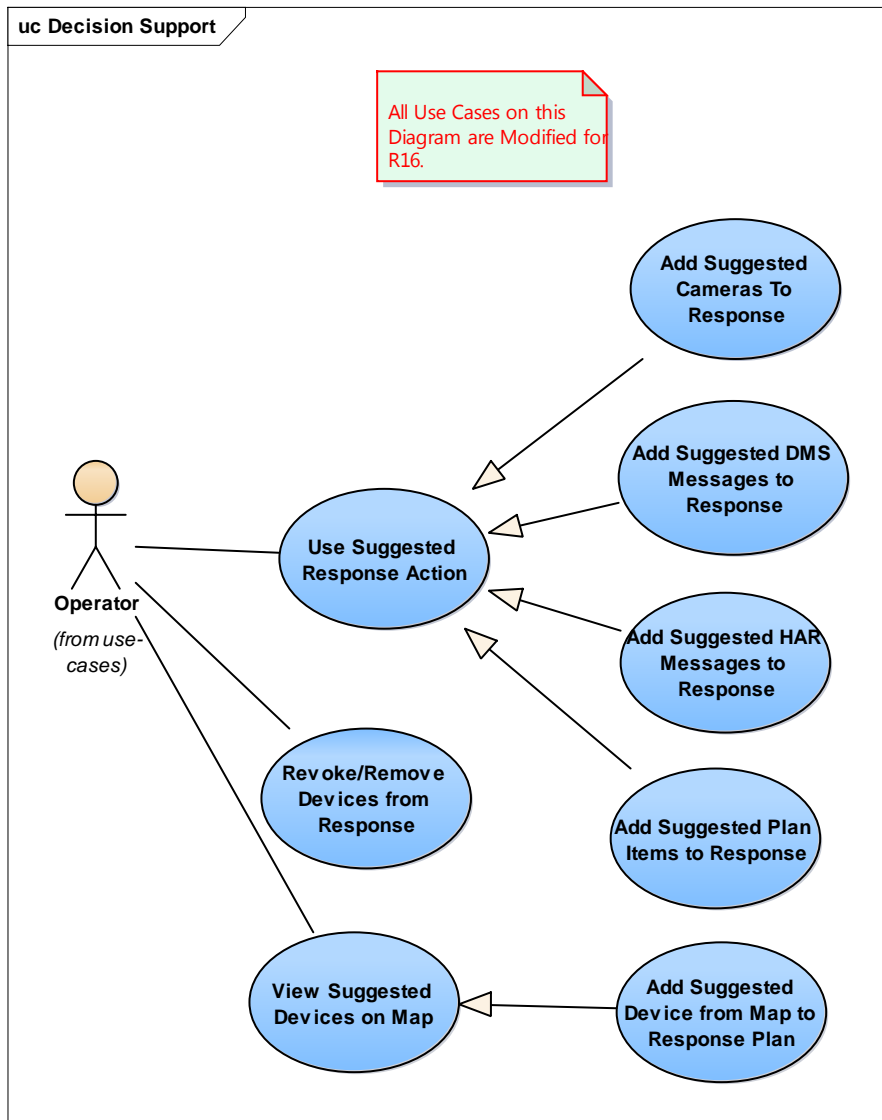


Figure 7-4. Decision Support UCD

7.3.1.1 Add Suggested Cameras To Response

A user with the Respond to Traffic Event right for the traffic event's owning organization may add one or more suggested cameras to the traffic event's response plan video tour.

7.3.1.2 Add Suggested DMS Messages to Response

A user with the respond to traffic event right for the event's owning organization may add a suggested DMS message to the current response plan. If the device is already in the response plan, it will be updated to use the suggested message. The user may also activate the message immediately when adding it.

7.3.1.3 Add Suggested Device from Map to Response Plan

A user with the respond to traffic event right for the event's owning organization can add a DMS, HAR, or Camera shown on the response suggestion map to the event's response plan.

7.3.1.4 Add Suggested HAR Messages to Response

A user with the respond to traffic event right for the event's owning organization may add a suggested HAR message to the current response plan. If the device is already in the response plan, it will be updated to use the suggested message. The user may also activate the message immediately when adding it.

7.3.1.5 Add Suggested Plan Items to Response

A user with the respond to traffic event right for the event's owning organization may add one or more suggested DMS or HAR plan item messages to the current response plan. If the device is already in the response plan, it will be updated to use the suggested message. The user may also activate the message immediately when adding it.

7.3.1.6 Revoke/Remove Devices from Response

A user with the respond to traffic event right for the event's owning organization may revoke/remove devices from the response plan of a traffic event that have been suggested to be revoked/removed from the response plan.

7.3.1.7 Use Suggested Response Action

A user with the respond to traffic event right for the event's owning organization may use a suggested response action. Refer to the extending use cases to see the list of supported response actions the user may use.

7.3.1.8 View Suggested Devices on Map

A user with the respond to traffic event right for the event's owning organization may view the suggested DMS, HAR, and Camera devices and the route from each suggested device to the traffic event on the Suggestions map.

7.4 Device Commissioned Date

7.4.1 Device Commissioned Date UCD

This diagram shows the use cases involved for the new Commissioned Date field for R16. Basically there are 7 device types affected: DMSs, HARs, SHAZAMs, Monitors, On/Off Devices, TSSs, and Cameras. Each device type supports Add, Copy, Edit, and View operations which are changing in R16 to include the new field.

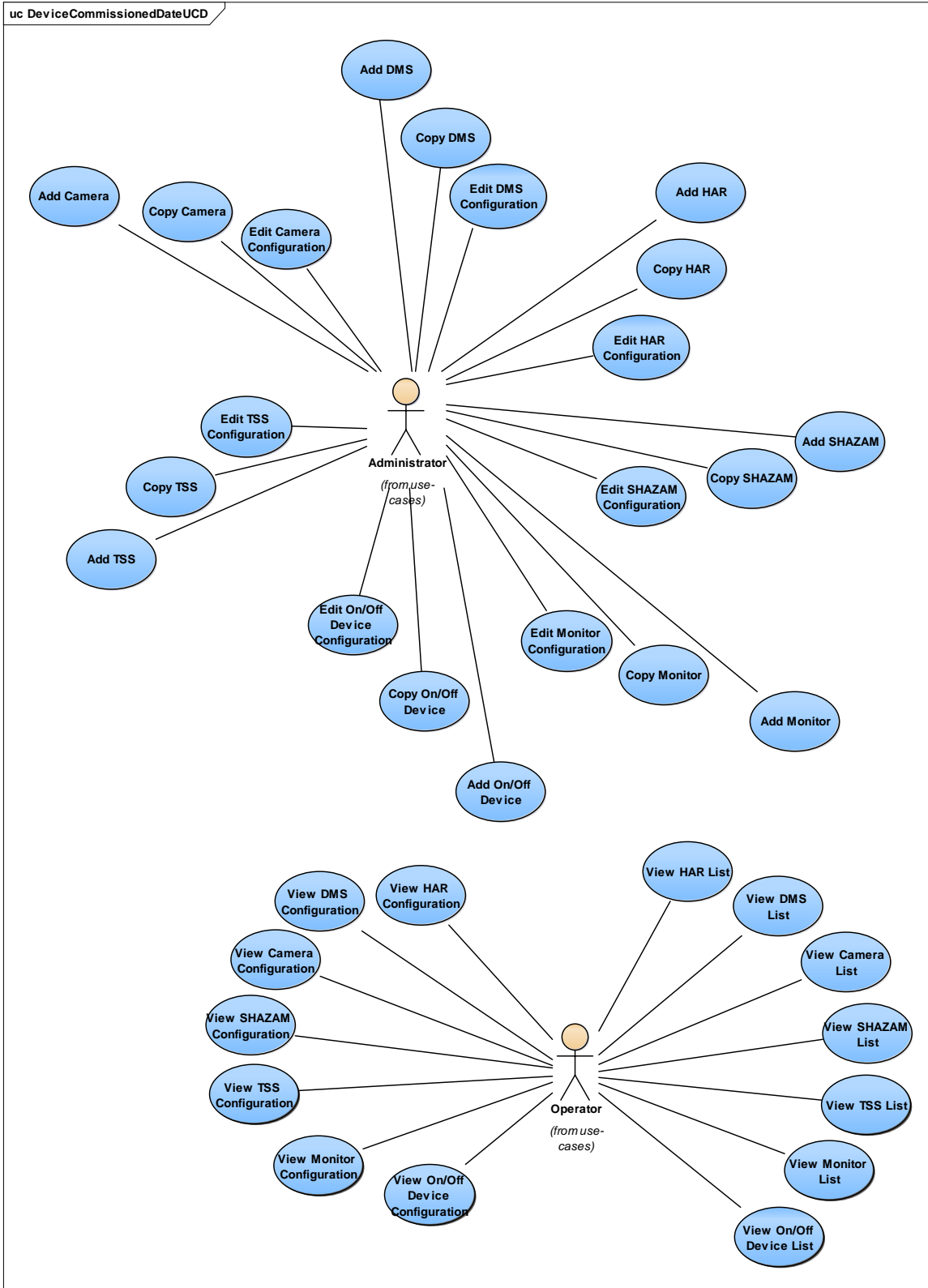


Figure 7-5. Device Commissioned Date UCD

7.4.1.1 Add Camera

The system will allow a user with the Configure Camera right to add a Camera. In R16, the user may specify a Commissioned Date when adding the device.

7.4.1.2 Add DMS

The system will allow a user with the Configure DMS right to add a DMS. In R16, the user may specify a Commissioned Date when adding the device and may enable the Managed Export feature, indicating the Export Managed DMS right is required for external clients to export the device.

7.4.1.3 Add HAR

The system will allow a user with the Configure HAR right to add a HAR. In R16, the user may specify a Commissioned Date when adding the device and may enable the Managed Export feature, indicating the Export Managed HAR right is required for external clients to export the device.

7.4.1.4 Add Monitor

The system will allow a user with the Configure Monitor right to add a Monitor. In R16, the user may specify a Commissioned Date when adding the device.

7.4.1.5 Add On/Off Device

The system will allow a user with the Configure On/Off Devices right to add an On/Off device. In R16, the user may specify a Commissioned Date when adding the device.

7.4.1.6 Add SHAZAM

The system will allow a user with the Configure HAR right to add a SHAZAM. In R16, the user may specify a Commissioned Date when adding the device and may enable the Managed Export feature, indicating the Export Managed SHAZAM right is required for external clients to export the device.

7.4.1.7 Add TSS

The system will allow a user with the Configure TSS right to add a TSS. In R16, the user may specify a Commissioned Date when adding the device and may enable the Managed Export feature, indicating the Export Managed TSS right is required for external clients to export the device.

7.4.1.8 Copy Camera

The system will allow a user with the Configure Camera right to copy a Camera. In R16, the user may specify a Commissioned Date when adding the copied device.

7.4.1.9 Copy DMS

The system will allow a user with the Configure DMS right to copy a DMS. In R16, the user may specify a Commissioned Date when adding the copied device and may enable the Managed

Export feature, indicating the Export Managed DMS right is required for external clients to export the device.

7.4.1.10 Copy HAR

The system will allow a user with the Configure HAR right to copy a HAR (ISS AP55 or DR1500 only; Synchronized HARs do not support the Copy operation). In R16, the user may specify a Commissioned Date when adding the copied device and may enable the Managed Export feature, indicating the Export Managed HAR right is required for external clients to export the device.

7.4.1.11 Copy Monitor

The system will allow a user with the Configure Monitor right to copy a Monitor. In R16, the user may specify a Commissioned Date when adding the copied device.

7.4.1.12 Copy On/Off Device

The system will allow a user with the Configure On/Off Devices right to copy an On/Off device. In R16, the user may specify a Commissioned Date when adding the copied device.

7.4.1.13 Copy SHAZAM

The system will allow a user with the Configure HAR right to copy a SHAZAM. In R16, the user may specify a Commissioned Date when adding the copied device and may enable the Managed Export feature, indicating the Export Managed SHAZAM right is required for external clients to export the device.

7.4.1.14 Copy TSS

The system will allow a user with the Configure TSS right to copy a TSS. In R16, the user may specify a Commissioned Date when adding the copied device and may enable the Managed Export feature, indicating the Export Managed TSS right is required for external clients to export the device.

7.4.1.15 Edit Camera Configuration

The system will allow a user with the Configure Camera right to edit the configuration for a Camera. In R16, the user may edit the Commissioned Date of the device.

7.4.1.16 Edit DMS Configuration

The system will allow a user with the Configure DMS right to edit the configuration for a DMS. In R16, the user may edit the Commissioned Date of the device and may enable the Managed Export feature, indicating the Export Managed DMS right is required for external clients to export the device.

7.4.1.17 Edit HAR Configuration

The system will allow a user with the Configure HAR right to edit the configuration for a HAR. In R16, the user may edit the Commissioned Date of the device and may enable the Managed Export feature, indicating the Export Managed HAR right is required for external clients to export the device.

7.4.1.18 Edit Monitor Configuration

The system will allow a user with the Configure Monitor right to edit the configuration for a Monitor. In R16, the user may edit the Commissioned Date of the device.

7.4.1.19 Edit On/Off Device Configuration

The system will allow a user with the Configure On/Off Devices right to edit the configuration for an On/Off device. In R16, the user may edit the Commissioned Date of the device.

7.4.1.20 Edit SHAZAM Configuration

The system will allow a user with the Configure HAR right to edit the configuration for a SHAZAM. In R16, the user may edit the Commissioned Date of the device and may enable the Managed Export feature, indicating the Export Managed SHAZAM right is required for external clients to export the device.

7.4.1.21 Edit TSS Configuration

The system will allow a user with the Configure TSS right to edit the configuration for a TSS. In R16, the user may edit the Commissioned Date of the device and may enable the Managed Export feature, indicating the Export Managed TSS right is required for external clients to export the device.

7.4.1.22 View Camera Configuration

The system will allow a user with the View Camera Configuration or Configure Camera right to view the configuration of a Camera. In R16, the information displayed will include the Commissioned Date of the device.

7.4.1.23 View Camera List

The system will allow the user to view the Camera List. For R16 the list includes a new Commissioned Date column, which is hidden by default. When visible, the user will be able to sort or filter the list by Commissioned Date.

7.4.1.24 View DMS Configuration

The system will allow a user to view the configuration of a DMS. In R16, the information displayed will include the Commissioned Date of the device and the Managed Export flag.

7.4.1.25 View DMS List

The system will allow the user to view the DMS List. For R16 the list includes a new Commissioned Date column, which is hidden by default. When visible, the user will be able to sort or filter the list by Commissioned Date. Also new for R16 is the Managed Export column, which is hidden by default. When visible, the user can sort and filter the list by this new column.

7.4.1.26 View HAR Configuration

The system will allow a user with the View HAR Configuration or Configure HAR right to view the configuration of a HAR. In R16, the information displayed will include the Commissioned Date of the device and the Managed Export flag.

7.4.1.27 View HAR List

The system will allow the user to view the HAR List. For R16 the list includes a new Commissioned Date column, which is hidden by default. When visible, the user will be able to sort or filter the list by Commissioned Date. Also new for R16 is the Managed Export column, which is hidden by default. When visible, the user can sort and filter the list by this new column.

7.4.1.28 View Monitor Configuration

The system will allow a user with the View Monitor Configuration or Configure Monitor right to view the configuration of a Monitor. In R16, the information displayed will include the Commissioned Date of the device.

7.4.1.29 View Monitor List

The system will allow the user to view the Monitor List. For R16 the list includes a new Commissioned Date column, which is hidden by default. When visible, the user will be able to sort or filter the list by Commissioned Date.

7.4.1.30 View On/Off Device Configuration

The system will allow a user with the View On/Off Device Configuration or Configure On/Off Devices right to view the configuration of an On/Off device. In R16, the information displayed will include the Commissioned Date of the device.

7.4.1.31 View On/Off Device List

The system will allow the user to view the On/Off Device List. For R16 the list includes a new Commissioned Date column, which is hidden by default. When visible, the user will be able to sort or filter the list by Commissioned Date.

7.4.1.32 View SHAZAM Configuration

The system will allow a user with the View HAR Configuration or Configure HAR right to view the configuration of a SHAZAM. In R16, the information displayed will include the Commissioned Date of the device and the Managed Export flag.

7.4.1.33 View SHAZAM List

The system will allow the user to view the SHAZAM List. For R16 the list includes a new Commissioned Date column, which is hidden by default. When visible, the user will be able to sort or filter the list by Commissioned Date. Also new for R16 is the Managed Export column, which is hidden by default. When visible, the user can sort and filter the list by this new column.

7.4.1.34 View TSS Configuration

The system will allow a user with the View TSS Configuration or Configure TSS right to view the configuration of a TSS. In R16, the information displayed will include the Commissioned Date of the device and the Managed Export flag.

View TSS List

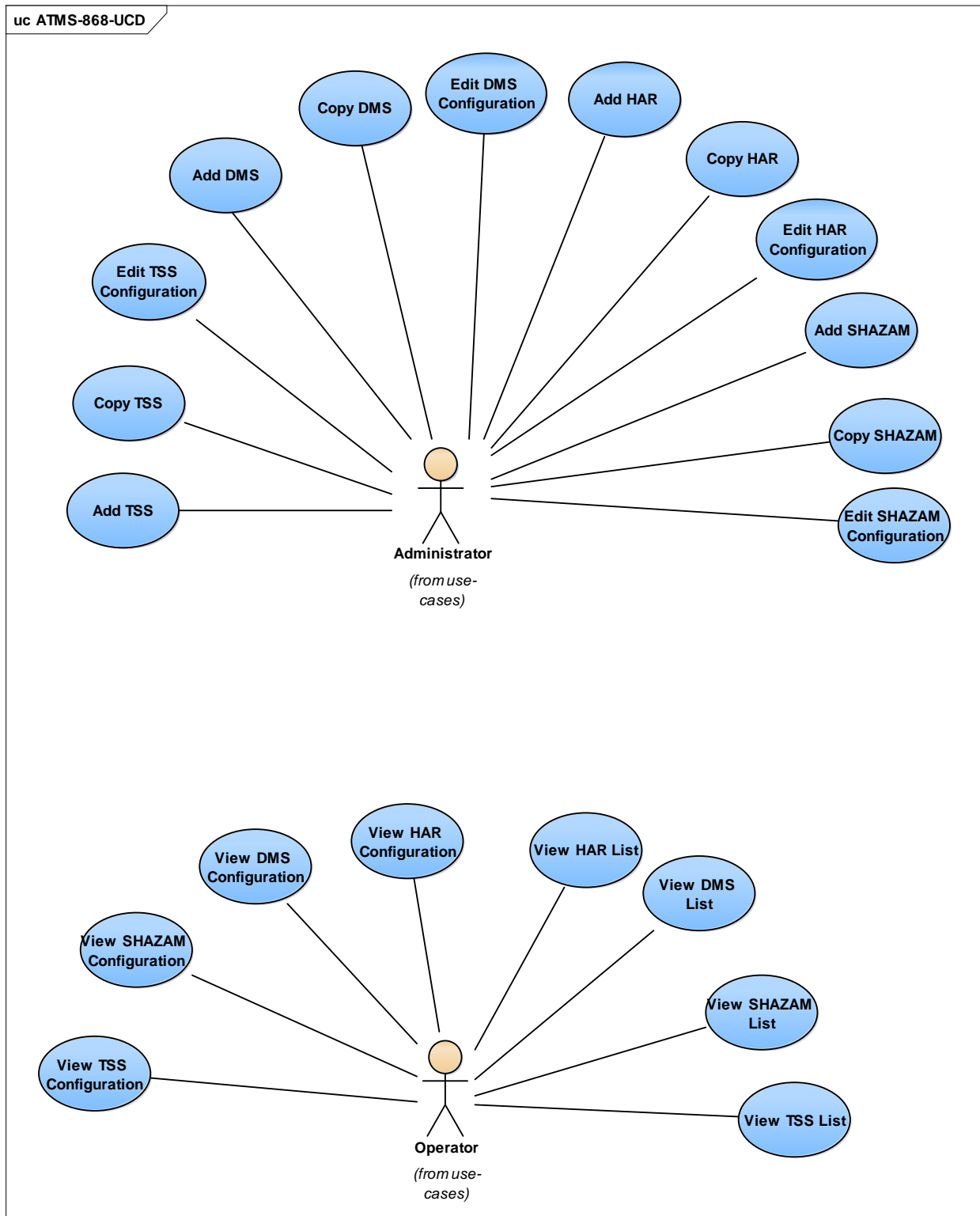
The system will allow the user to view the TSS List. For R16 the list includes a new Commissioned Date column, which is hidden by default. When visible, the user will be able to

sort or filter the list by Commissioned Date. Also new for R16 is the Managed Export column, which is hidden by default. When visible, the user can sort and filter the list by this new column.

7.5 Managed Export

7.5.1 Managed Export UCD

This diagram shows the use cases involved for the new Managed Export field for R16 (ATMS-868). There are 4 device types affected: DMSs, HARs, SHAZAMs, and TSSs. Each device type supports Add, Copy, Edit, and View operations which are changing in R16 to include the new field. This field is used in combination with new user rights for each device that will be applied to external clients to determine if they can or cannot receive data for a device that has the Managed Export flag set to true. NOTE that Monitors and On/Off Devices are not being updated to have this new field because they are not exported. Cameras are not included here because they are being modified as part of a different work order (WO54); see the CCTV Export feature use cases.

**Figure 7-6. Managed Export UCD**

See Section 7.4.1 for details on each of the Use Cases shown in Figure 7.6. The Use Cases in this diagram are all used in that diagram as well.

7.6 Lufft Interface

7.6.1 Acquire Lufft Weather data UCD

This diagram shows uses of the system related to acquiring weather sensor data from Lufft.

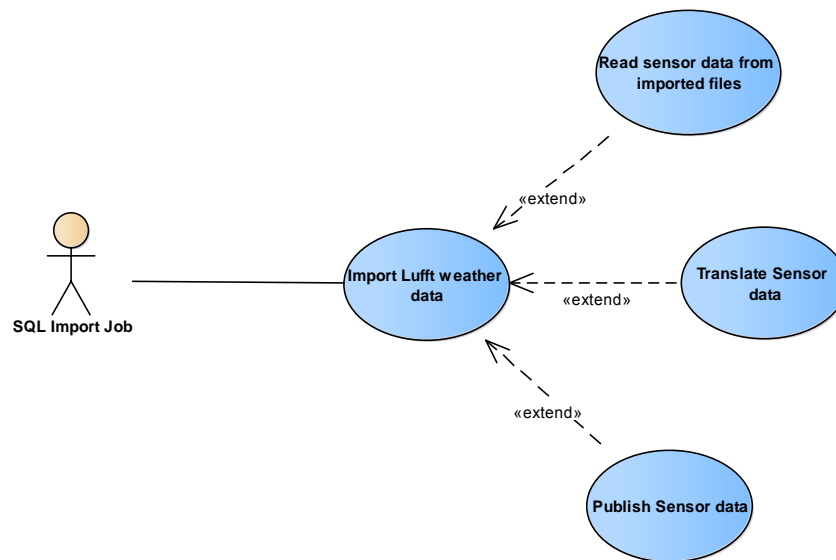


Figure 7-7. Acquire Lufft Weather data UCD

7.6.1.1 Import Lufft weather data

The SQL Import job will import the Lufft weather data periodically into the CHARTWeb database. The plan is to have SmartView write exported files to a shared network directory for consumption by the SQL Import Job. The file names will be tagged for CHART use to identify the weather station it represents.

7.6.1.2 Read sensor data from imported files

The weather sensor data will be read from the imported Lufft csv files. Some of the column headers for the sensors in the csv file will be tagged for CHART use.

7.6.1.3 Publish Sensor data

The translated (& imported) weather sensor data will be published in the CHARTWeb database to be used by the Weather Service, Chart on the Web, EORS, Intranet Map and Trigger module. A new database table will be added to hold the imported weather sensor data.

7.6.1.4 Translate Sensor data

The imported weather sensor data will be translated based upon pre-defined rules. Tags specified in the file names and column headers will be evaluated appropriately. The data will be formatted based upon the translation rules.

7.7 Miscellaneous

7.7.1 Miscellaneous UCD

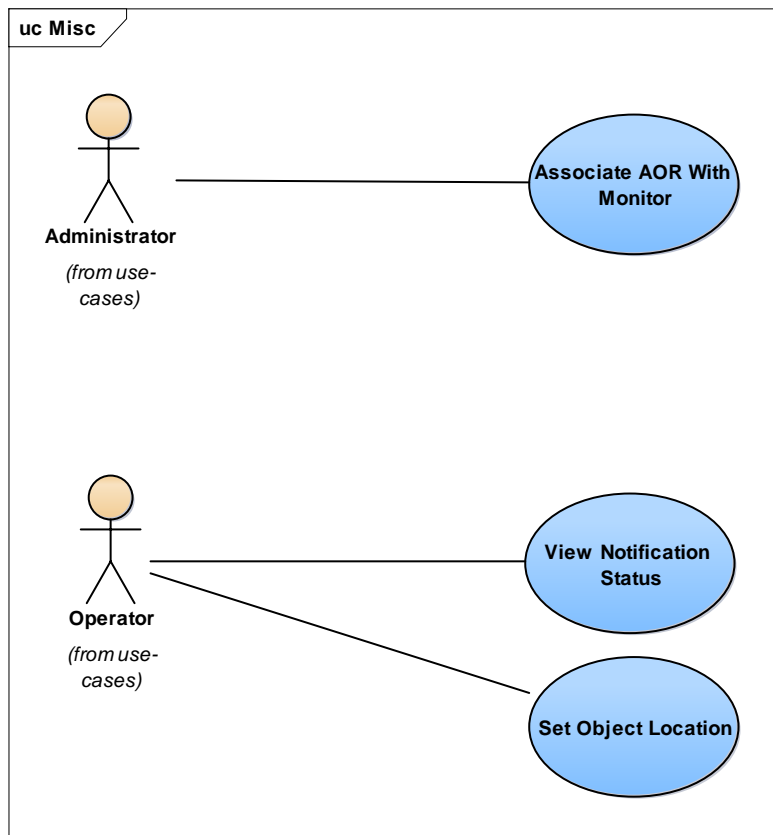


Figure 7-8. Miscellaneous UCD

7.7.1.1 Associate AOR with Monitor

A user with the right to configure a monitor can set the areas of responsibility (AOR) associated with the monitor. This includes the ability to remove the association of an AOR from the monitor. In R16, this feature is being fixed; in R15 and prior it incorrectly required the "Configure System Profile" user right and produced a non-descriptive error message if a user without the configure monitor right attempted these actions. This correction is tracked as ATMS-638.

7.7.1.2 Set Object Location

A user can set the location of traffic events and devices during their initial creation or by editing the existing location. In R16 for task 104 PR ATMS-597, the selectable roadway direction of "South/North" is changed to "North/South". This change carries through to the default event or device name. This does not apply to DMS or SHAZAM devices, which do not support bi-directional locations.

Also, for issue ATMS-571, when setting a location using a county milepost as an intersecting feature, the system is changed to show the range of valid county milepost numbers for the selected county and route.

7.7.1.3 View Notification Status

The user can view the status of each notification, including the status for each individual recipient. In R16 as part of ATMS-536, this feature is being fixed such that if an invalid e-mail address exists, the status is still updated properly. Prior to this fix, the existence of an invalid e-mail address would cause the status for all recipients to be stuck at "requested", even though the notification was sent to valid addresses and failed on the invalid addresses.

7.8 RV Vehicle Types

7.8.1 RV Vehicle Types UCD

This diagram shows uses of the system related to RV vehicle types.

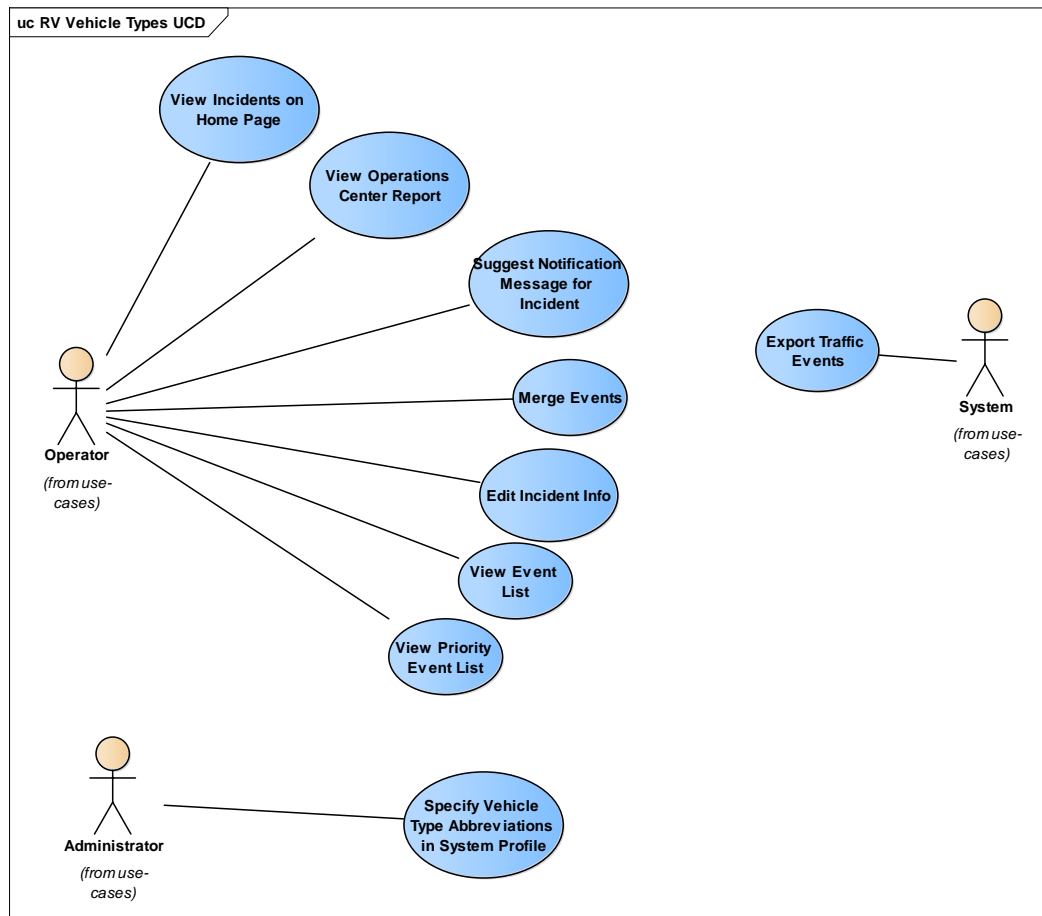


Figure 7-9. RV Vehicle Types UCD

7.8.1.1 View Incidents on Home Page

The system will show the vehicles involved for an incident on the Home Page (Incidents tab), if specified for the incident. In R16 this description will include details for RV and RV (with trailer) types, if specified.

7.8.1.2 View Operations Center Report

The system will allow the user to view the Operations Center Report for their operations center. The Operations Center Report shows the list of open events for the user's operation center, including a summary of Vehicles involved in incidents. In R16, the description in the Vehicles column will include the RV and RV (with trailer) types, if specified.

7.8.1.3 Suggest Notification Message for Incident

The system will allow a user to suggest a message when creating a notification message to send for an incident event. The system will allow the user to invoke a Suggest command, which inserts a suggested message into the message text field using criteria which includes various aspects of the event, including the vehicles involved. The system will also allow the user to invoke a Vehicles shortcut, which inserts the subset of that suggestion that is only related to the vehicles involved. For R16, both the Suggest and Vehicles shortcut will include the RV and RV

(with trailer) types, if specified for the incident. The text inserted into the message will use the vehicle type abbreviations as specified in the System Profile.

7.8.1.4 Merge Events

The system will allow a user with the Merge Traffic Events right to merge open traffic events. Prior to merging, the system will display the information (including vehicles involved, if applicable) for each of the events being merged, and will allow the user to choose which data to merge, and will display a preview of the merge. In R16, the merge operation will include the RV and RV (with trailer) types as part of the vehicle information being merged, if applicable. This includes the pre-merge display and merge preview, as well as the merge operation itself.

7.8.1.5 Edit Incident info

The system will allow a user with the Manage Traffic Events right to edit the information for an incident, including the vehicles involved information. For R16, the RV and RV (with trailer) types are being added. The user will be able to enter the following vehicle counts for the RV type: Involved and Overturned. For the RV (with trailer) type, the user will be able to enter the counts for Involved, Overturned, Lost Load, and Jack Knifed.

7.8.1.6 View Event List

The system will allow a user to view the list of events, which includes a Vehicles column showing a description of the vehicle counts. For R16, this description will include the RV and RV (with trailer) vehicle types, if specified for an incident. The system also allows the user to sort and filter the list. For R16, a new "RV" filter value will be added to filter on the new vehicle types.

7.8.1.7 View Priority Event List

The system will allow the user to view the Priority Event List, which includes information about high-priority traffic events. The Priority Event List includes a Vehicles column, which has a description of vehicle counts for incidents, if specified. For R16 the vehicle count description will include the RV and RV (with trailer) vehicle types, if specified.

7.8.1.8 Export Traffic Events

The ATMS Export Service will export traffic event-related data, including vehicles involved. For R16, the RV and RV (with trailer) vehicle types will be added to the list of other vehicle types that are exported.

7.8.1.9 Specify Vehicle Type Abbreviations in System Profile

The system will allow a user with the Configure System right to edit the text abbreviations for usage when suggesting a notification message for an incident. In R16, the vehicle types: RV and RV (with trailer) will be added to the types supporting abbreviation.

7.9 Traffic Event Management

7.9.1 Traffic Event Management UCD

This diagram shows use cases related to traffic event management that are new or changed for R16 (with the exception of Incident SubType related changes, which are depicted in a separate diagram).

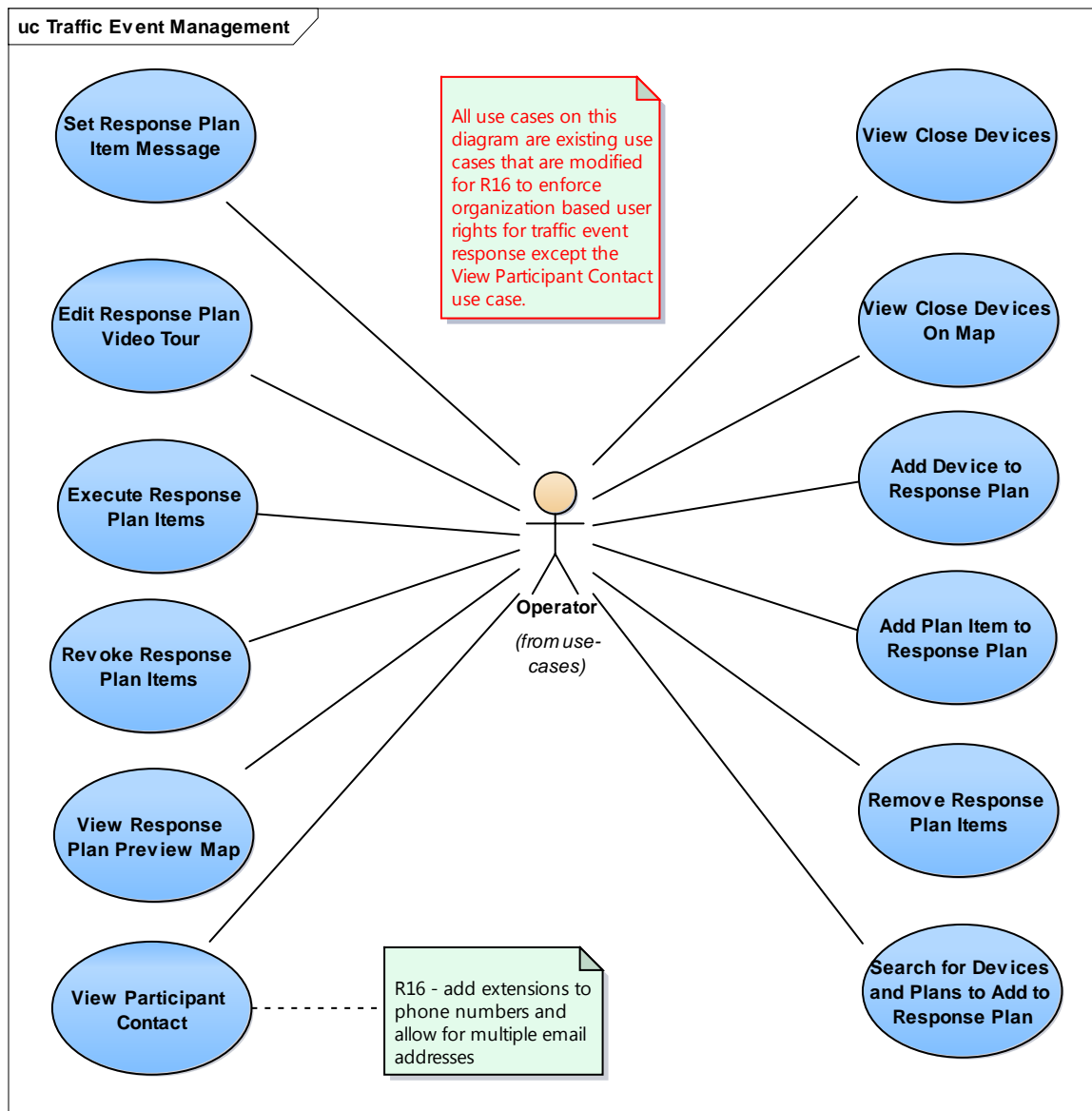


Figure 7-10. Traffic Event Management UCD

7.9.1.1 Add Device to Response Plan

A user with the respond to traffic event right for the event's owning organization can add a DMS, HAR, Camera, or On/Off Device to the event's response plan.

7.9.1.2 Add Plan Item to Response Plan

A user with the respond to traffic event right for the event's owning organization can add a plan or individual plan items to the event's response plan. This includes HAR, DMS, and On/Off Device plan items.

7.9.1.3 Edit Response Plan Video Tour

A user with the respond to traffic event right for the event's owning organization can edit the response plan video tour that contains the cameras that have been added to the response plan. This includes adding cameras or removing cameras to/from the tour, changing the order in which cameras appear in the tour, setting the preset for a camera in the tour, and copying a camera that already exists in the tour (so the camera can be displayed another time, presumably with a different preset).

7.9.1.4 Execute Response Plan Items

A user with the respond to traffic event right for the event's owning organization can execute a response plan item (or multiple items). Executing a DMS, HAR, or On/Off Device response plan item adds an entry to the device's queue, while executing a camera tour response plan item activates the camera tour, adding the tour to any auto mode monitors configured with an Area of Responsibility (AOR) that contains the event location.

7.9.1.5 Remove Response Plan Items

A user with the respond to traffic event right for the event's owning organization can remove a response plan item (or multiple items) from the event's response plan.

7.9.1.6 Revoke Response Plan Items

A user with the respond to traffic event right for the event's owning organization can revoke the execution of a response plan item (or multiple items) that has been executed.

Search for Devices and Plans to Add to Response Plan

A user with the respond to traffic event right for the event's owning organization can search for DMS, HAR, On/Off Devices, Cameras, or Plans to add to the event's response plan.

7.9.1.7 Search for Devices and Plans to Add to Response Plan

A user with the respond to traffic event right for the event's owning organization can search for DMS, HAR, On/Off Devices, Cameras, or Plans to add to the event's response plan.

7.9.1.8 Set Response Plan Item Message

A user with the respond to traffic event right for the event's owning organization can set the message of a DMS or HAR response plan item (or multiple items).

7.9.1.9 View Close Devices

The user can view devices that are within a selected radius of the traffic event, in tabular form. Each device shown that is not already in the response plan of the event contains a button to allow the device to be added to the response plan if the user has the respond to traffic event right. In R16 the user rights checking is being made more stringent; the user must have the respond to

traffic event right for the organization that is currently specified as the owning organization of the traffic event.

7.9.1.10 View Close Devices on Map

The user can view devices that are within a selected radius of the traffic event on a map. Each device not already in the response plan of the event can be selected and added to the response plan if the user has the respond to traffic event right. In R16 the user rights checking is being made more stringent; the user must have the respond to traffic event right for the organization that is currently specified as the owning organization of the traffic event.

7.9.1.11 View Participant Contact

A user with the View Contact Info right can view detailed contact info for each Participant Resource or Type (if associated with a Contact) or each Participant Contact that is associated with a Traffic Event. Detailed information includes First Name, Last Name, Agency, Office/Shop, Radio Call Sign, Phone Numbers (with optional extension), Email Addresses, and Do Not Contact Schedule.

7.9.1.12 View Response Plan Preview Map

A user with the respond to traffic event right for the event's owning organization can view a map showing the location of all devices included in the event's response plan.

7.10 Traffic Event Management Incident Sub-Types

7.10.1 Traffic Event Management Incident Subtypes UCD

This diagram shows uses of the system related to traffic event incident sub-types.

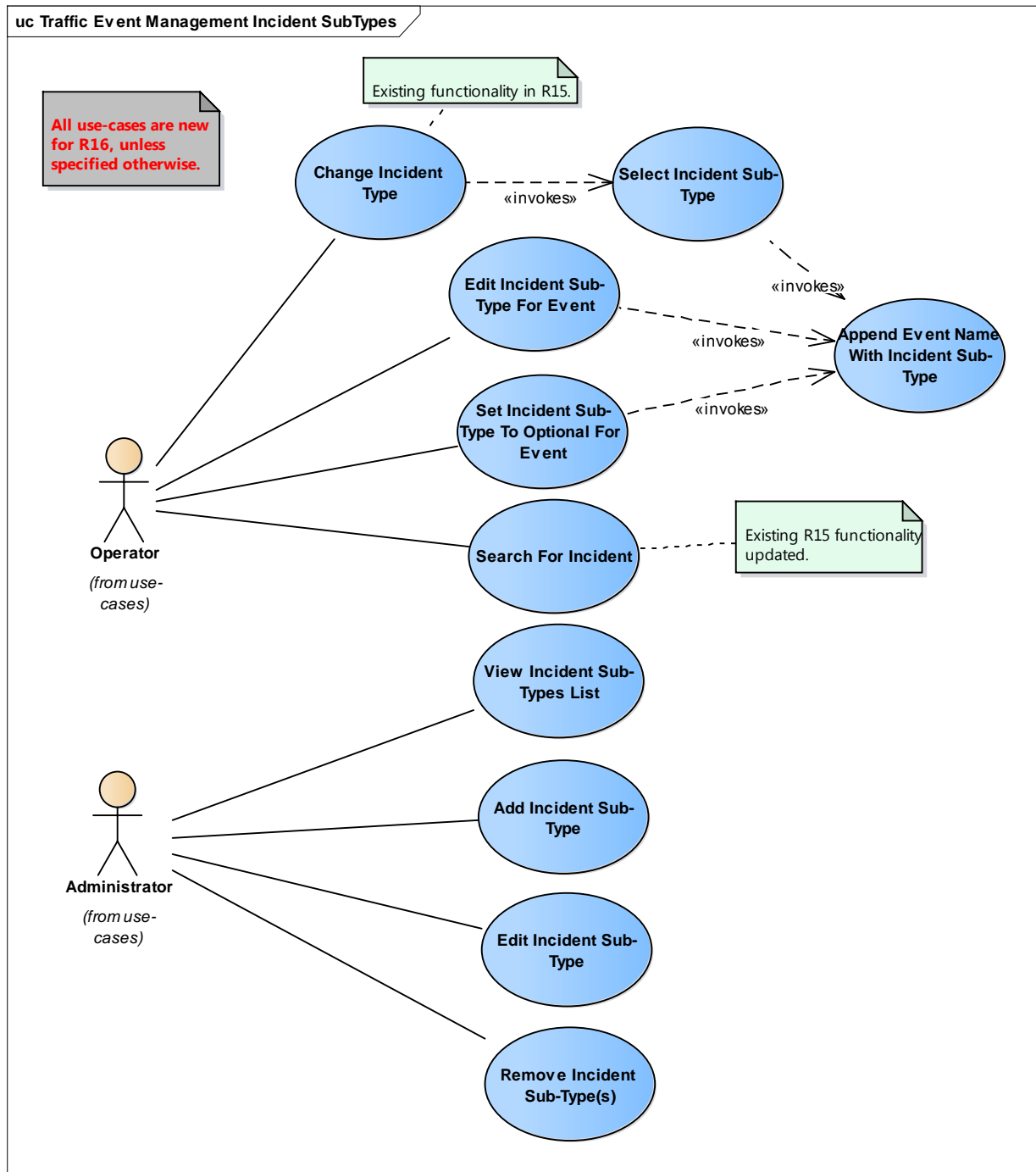


Figure 7-11. Traffic Event Management Incident SubTypes (UCD)

7.10.1.1 Change Incident Type

The system will allow a user with Manage Traffic Events rights to change the incident type for an open or pending incident event from the Edit Incident Information Page. For R16, the system will also display the list of pre-defined incident sub-types for each incident type for a single optional selection.

7.10.1.2 Select Incident Sub-Type

The system will allow a user in R16 with the Manage Events right to select an optional sub-type from the list of pre-defined sub-types. The list of sub-types is refreshed for the possible selections corresponding to the currently selected incident type. Any previously set incident sub-type is reset to the default option upon change to the incident type.

7.10.1.3 Append Event Name with Incident Sub-Type

Once a user selects a value from the pre-defined incident sub-types list, the system in R16 will automatically append the sub-type text to the event name following the incident type. The updated event name will be viewable on the Events Details page, Open/Closed Event List pages, Pending Events List, Operations Center Report, Open Events and Devices, Home Page Events Tab, and Used By Device Details pages.

7.10.1.4 Edit Incident Sub-Type for Event

The system will allow a user in R16 with the Manage Events right to edit the currently selected sub-type without modifying the current incident type selected. The user may choose a different sub-type from the currently defined sub-types of the incident type. The event name displayed in the GUI will automatically be updated with the incident sub-type text once selected.

7.10.1.5 Set Incident Sub-Type To Optional For Event

The system will allow a user in R16 with the Manage Events right to clear the incident sub-type from the event name and set the incident sub-type to optional by selecting the blank option from the list of pre-defined sub-types.

7.10.1.6 Search for Incident

The system currently allows a user with View Sensitive Traffic Event Info rights to search for an event by event name or description. In R16, the search will be expanded to include search by incident sub-type names. Any incident events which match a portion of the incident sub-type text will be returned in the results.

7.10.1.7 View Incident Sub-Types List

The system will allow a user with Configure Systems rights in R16 to view from the system profile the list of incident sub-types currently defined in ATMS. For each of the current 17 incident types, a list of zero or more sub-types may be viewed, added, updated, and/or removed.

7.10.1.8 Add Incident Sub-Type

The system will allow a user in R16 with the Configure Systems right to add a pre-defined sub-type to any of the current 17 incident types in ATMS. The sub-type will consist of a 100 character text name and an associated parent incident type.

7.10.1.9 Edit Incident Sub-Type

The system will allow a user with the Configure Systems right in R16 to edit an existing pre-defined sub-type for any of the current 17 incident types in ATMS. Any updates to a sub-type will not affect any current assignments in any open, pending, or closed incidents.

7.10.1.10 Remove Incident Sub-Type(s)

The system will allow a user with the Configure Systems right in R16 to remove a specific existing sub-type or all sub-types associated under a specific parent incident type. Once a sub-type is removed, any current associations to the sub-type name in any open or pending incidents will remain until either the parent incident type or sub-type is specifically changed for the event.

7.11 CHARTWeb CCTV Updates

7.11.1 CHARTWeb UCD

This diagram shows uses related to viewing traffic cameras via Intranet Map or Internet Map.

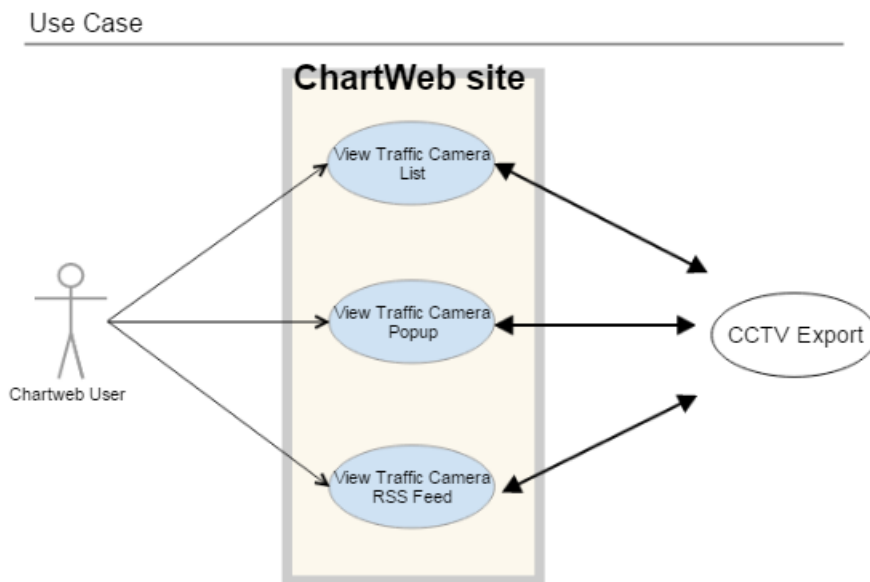


Figure 7-12. CHARTWeb UCD

7.11.1.1 View Traffic Camera

The system will allow anyone accessing CHARTWeb to view Traffic Cameras from a popup window. Those camera links will be derived from Chart CCTV Export.

7.11.1.2 View Traffic Cameras Web Page

The system will allow anyone accessing CHARTWeb to see a list of Traffic Cameras on the Traffic Cameras page. The list will be derived from data from CHART CCTV Export. The interface is also changing from a tabbed interface to a navigation bar interface. The navigation bar will allow people to select either from all the cameras, or reduce down to just those in certain regions.

7.11.1.3 View Traffic Cameras RSS/XML Feed

The system will allow anyone accessing CHARTWeb to access an RSS feed (which is an XML page) that contains all the cameras that are viewable to the public. The feed will also remove the county data field. The document will be derived from data from CHART CCTV Export.

8 System Interfaces Design (IDL)

For convenient viewing, new and modified IDL designs are included in a separate document for viewing with a browser. Unzip the zip file CHART-ATMS-R16-Design-HTML.zip. Open the file `index.htm` in the top-level directory. See the example in Figure 8-1 for where to find links to the IDL class diagrams.

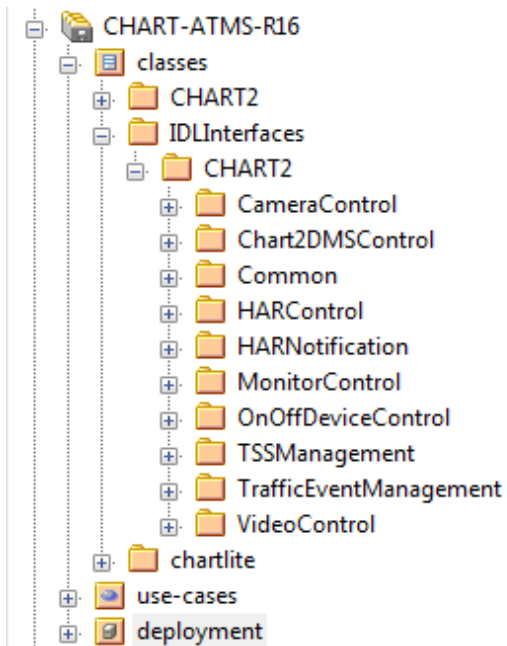


Figure 8-1. Where to Find IDL Interfaces Classes in HTML Design

9 Package Designs

For convenient viewing, new and modified package designs are included in a separate document for viewing with a browser. Unzip the zip file CHART-ATMS-R16-Design-HTML.zip. Open the file `index.htm` in the top-level directory. See Figure 9-1 for where to find links to the classes for CHART2 (server) diagrams and chartlite (GUI) class diagrams.

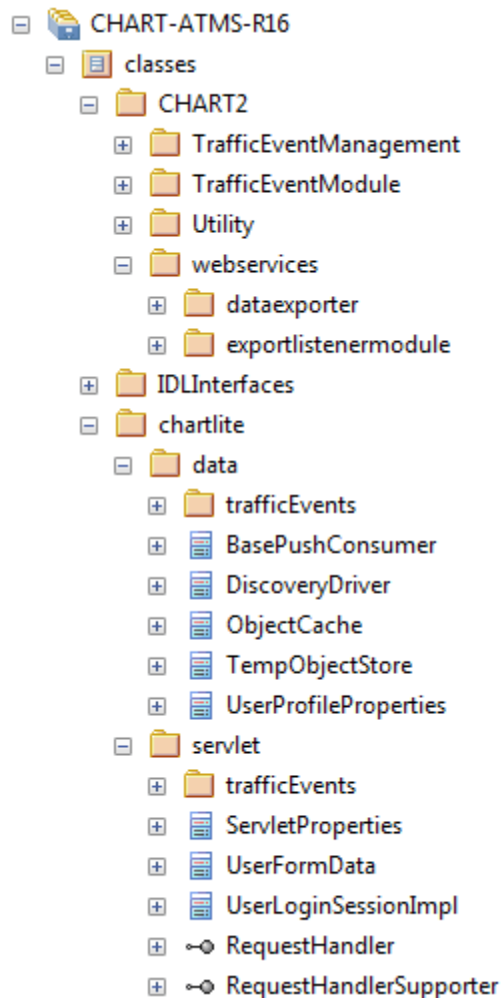


Figure 9-1. Where to Find CHART2/chartlite Classes in HTML Design